MAY 26, 1952 NEWS ISSUE

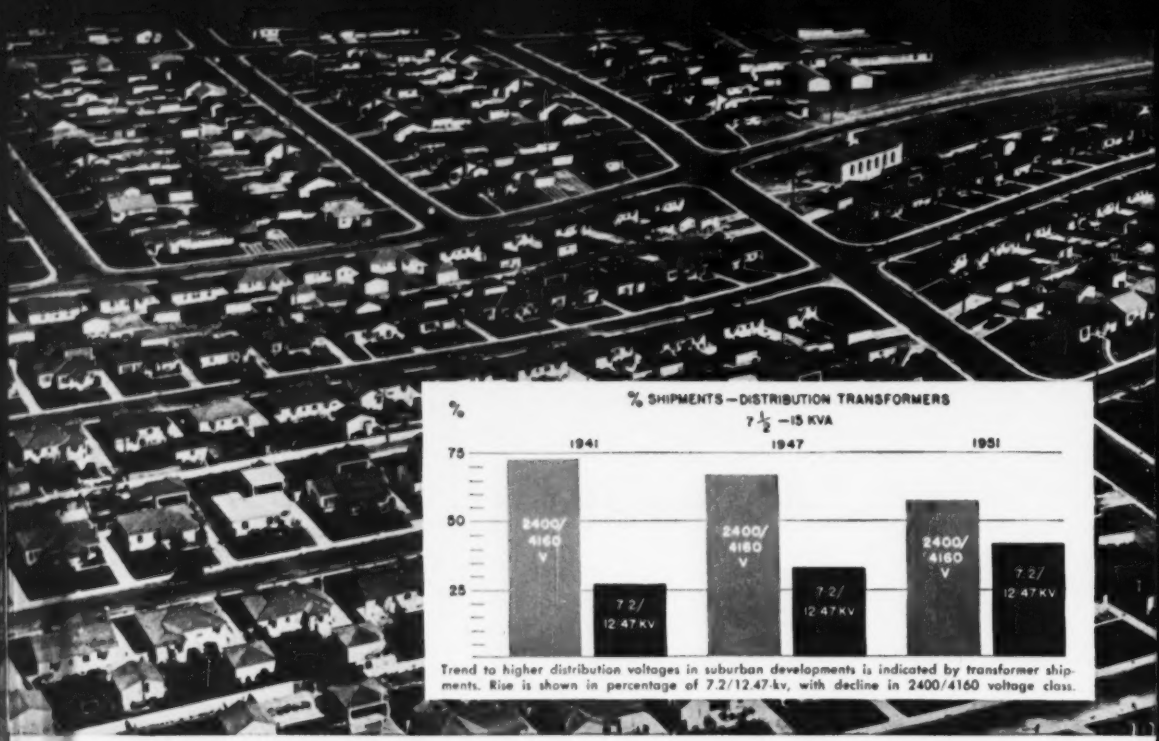
Electrical World

Price 35 Cents A McGRAW-HILL PUBLICATION

Dale E. Doty of FPC: All the power we can get, no matter who develops it . . . Page 10

Canada Plunges Ahead on the Niagara . . . Page 15

Bond Yields – Up? Down? . . . Page 50



Trend to higher distribution voltages in suburban developments is indicated by transformer shipments. Rise is shown in percentage of 7.2/12.47-kv, with decline in 2400/4160 voltage class.

Expanding home construction speeds trend to

HIGHER DISTRIBUTION VOLTAGES

Increasing shipments of high-voltage distribution transformers at G-E Pittsfield Works are noted by R. W. Smith, Mgr., Dist. Transformer Dept. and D. K. Blake, Mgr., Transmission and Distribution Engineering. This photo was taken in new warehousing and shipping center, designed to expedite shipments.

Greater savings seen as utilities meet important new loads

To electric utility engineers, one of the most challenging developments in domestic load is the mushrooming growth of new housing developments surrounding almost all cities. In some instances, unique opportunities are presented for an entirely fresh approach to distribution problems, unhampered by the limitations of established systems.

The situation is a natural, for instance, for the starting of a higher voltage class—12-kv to 13.2-kv—instead of extending the 2400/4160-v circuits so widely used in urban areas.

With light load densities and long feeders, usual in newly developing suburbs, higher voltage distribution will in many cases save more money per kva. It also increases the availability of sources for farm line extensions. Once started at light kva density per square mile, the higher voltage can be good up to 15 to 30 times the starting density before reaching the corresponding circuit congestion of a 4-kv system.

An increasing trend to higher distribution voltages is already evident. With home building expected to continue at high levels, the trend should become even more pronounced in the years ahead. The important thing is to plan early, so that maximum benefits may be enjoyed. Economic aspects will be discussed in a forthcoming AIEE paper to be presented by D. K. Blake. Utility men will be interested in securing a copy. General Electric Company, Schenectady 5, New York.

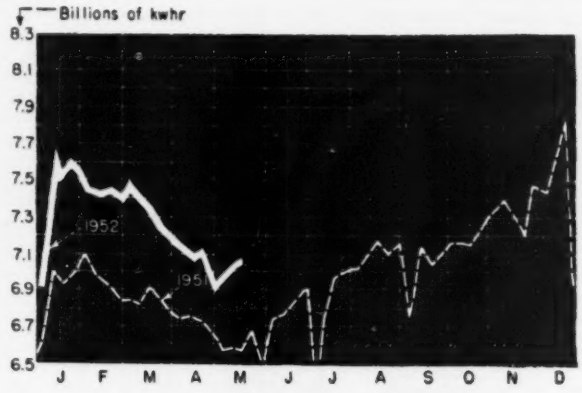
301-199

MORE POWER TO AMERICA

GENERAL ELECTRIC

VOLUME 137, NO. 21

May 26, 1952 Electrical World



Output Week Ended May 17—7,085,000,000* Kwhr

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
May 17	+8.0*	(Data on regional change not available at press time)								
May 10	+7.2	+2.4	+4.1	+3.3	+6.9	+13.9	+15.9	+6.4	+6.5	+9.3
May 3	+5.9	+4.8	+5.1	+0.6	+5.1	+12.0	+12.5	+1.7	+4.7	+8.5

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Loads (Million Kw)	Mar.	66.5*	66.9	61.4
Capacity (Million Kw)	Mar.	76.34	75.99	70.25
Production (Billion Kwhr)	Mar.	33.04	31.54	30.92
Hydro		10.44	9.46	9.22
Fuel		22.60	22.07	21.70
Fuel Consumption				
Coal (Million Tons)	Mar.	8.84	8.74	9.03
Oil (Million Barrels)		5.22	4.77	5.53
Gas (Billion Cu Ft)		57.39	54.82	48.48
Sales (Billion Kwhr)	Feb.	29.08	29.72	26.50
Residential		8.51	8.87	7.58
Commercial		4.87	4.99	4.89
Industrial		13.82	13.90	12.64
Other		1.88	1.95	1.79
Net Income Class A & B Companies ($ Million)	Mar.	82.65	88.00	71.10
Estimated Dec. 52 Peak (Million Kw)	Feb.	80.5	80.6	78.0
Kwhr per Residential Customer (12 Month Average)	Feb.	2,037	2,021	1,867
Revenue per Kwhr Residential Service (12 Month Average)	Feb.	2.80¢	2.81¢	2.86¢
Canadian Production (Billion Kwhr)	Mar.	5.22	4.97	4.91

Business Statistics

FRB Industrial Production Index†††	Mar.	217*	218	219
Gross National Product Annual Rate ($ Billion)	1st Qtr.	339.0*	334.6	319.5
E. W. 5 Industry Production Index	Apr.	124.0*	123.8	122.6
ENR Construction Cost Index††	May	116.8	116.2	113.6
BLS Consumer's Price Index	Mar.	188.0	187.9	184.5
NEMA Insulation Materials, Sales Index†	Feb.	528	548	552
NEMA Electric Appliance Sales Index†	Feb.	224	233	343
NEMA Household Refrig. Sales Index†	Feb.	153	153	238

* Estimated. † 1936=100 †† 1949=100 ††† 1937-39=100 (Unadjusted)

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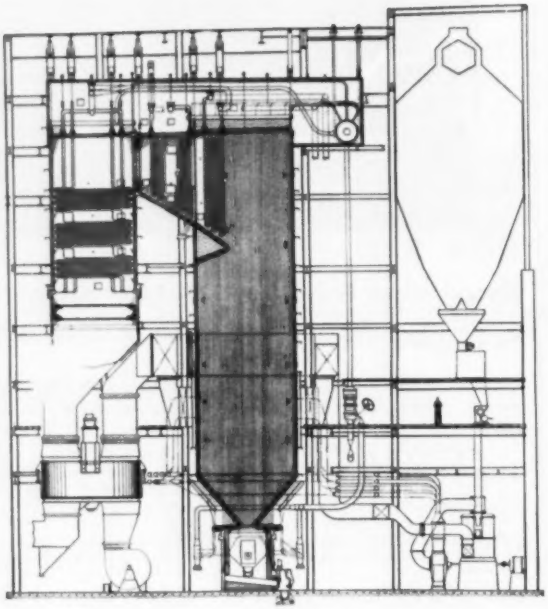
EASTLAKE PLANT

The Cleveland
Electric Illuminating Company

C-E controlled circulation boilers



The C-E Unit shown above is one of three duplicates now in process of fabrication for the Eastlake Plant of The Cleveland Electric Illuminating Company of Cleveland, Ohio.

Each of the three units is designed to serve a 125,000 kw turbine-generator operating at a throttle pressure of 1800 psi with a primary steam temperature of 1050 F, reheated to 1000 F.

These units are of the controlled-circulation, radiant type with a reheater section located between the primary and secondary superheater surfaces. An economizer section follows the rear superheater section and regenerative type air heaters follow the economizer surface.

Pulverized coal firing is employed, using bowl mills and tilting, tangential burners.

C-E

COMBUSTION ENGINEERING—SUPERHEATER, INC.

200 Madison Avenue, New York 16, N. Y.

B-578

ALL TYPES OF BOILERS, FURNACES, PULVERIZED FUEL SYSTEMS AND STOKERS; ALSO SUPERHEATERS, ECONOMIZERS AND AIR HEATERS

THE ELECTRICAL WEEK

Featured in This Issue

Atomic Energy Commission has three choices in supplying 1.8 million kw for its Ohio Valley gaseous diffusion plant (p 7) . . . Reclamation has plan for developing California's Trinity River (p 8) . . . Dale E. Doty takes over his new job as member of FPC (p 10) . . . Canada is well on her way to redeveloping her half of the Niagara (p 15) . . . USBR touches off its Golden Jubilee celebration (p 22) . . . First 345-kv line in the West being built by British Columbia Electric Co (p 32) . . . Bond yields will continue downward or start on an uptrend, depending on which group of Wall Street analysts you talk to (p 50).

• • •

Latest from Washington—Testifying before a House Public Works subcommittee, TVA's Chairman Gordon Clapp says the agency earned a net return of 5.4% on its power investment in 1951. Net power earnings totaled $26.7 million on an investment of $496 million . . . Commerce Department's Office of Technical Services publishes a handbook, "Aluminum Symposium," $3 a copy, covering forming, machining, and joining design for castings and extrusions, cost and stress considerations . . . FPC issues a one-year preliminary permit to Blue Ridge Electric Membership Corporation for a proposed 13,200-kw hydro project on south fork of New River in Wake County, N. C.

Senate is racing against time to consider the St. Lawrence Seaway and Power Project bill. Seaway legislation is near the bottom of the calendar and political conventions begin in six weeks. On the House side the outlook is less bright . . . AEC has developed a low-cost, under-water reactor to be used for experimental purposes . . . Hearings continued last week before the Senate Appropriations Committee on Interior Department appropriations . . . Pro-public power groups meet in Washington today to consolidate their efforts in getting more public power.

From East South Central—In authorizing a private electric utility to serve an industrial plant, Kentucky PSC found it was not the intent of rural electrification program that cooperatives should be organized to compete for industrial power loads when a private utility is in the vicinity and is ready, willing, and able to provide the desired service (Taylor County Rural Electric Cooperative Corporation v. Kentucky Utilities, Case No. 2268, May 7, 1952).

From the Southeast—Florida P&L, still with three years to run on its present franchise with the City of Miami, plans to apply to the City Commission for an election on a new long-term franchise to facilitate its tremendous expansion program . . . Georgia Power opens a new office in Darien, Ga.

Construction—Jacksonville, Fla., completes preliminary steps toward proposed $18-million expansion program. City Commissioners have approved $2.4-million contract with Westinghouse for two 40,000-kw units. City will finance program by sale of electric revenue certificates which must be approved by voters.

Financial—California Electric Power proposes to sell later this year about $5 million bonds competitively and about $2.5 million preferred and $2.5 million common stocks . . . Rochester G&E registers with SEC $6 million first mortgage bonds 1982 to be sold competitively . . . Kansas Power & Light sells $4,750,000 first mortgage bonds, 3¼% due 1982 at 100.96% to institutions through First Boston Corp.

Labor—The 956 professional and technical employees of Pacific G&E elect as their bargaining representative the San Francisco Area Group of Professional Employees, an affiliate of National Professional Association of Engineers, Architects and Scientists in a special NLRB election. The vote tallied: San Francisco Area Group, 390; IBEW, AFL, 205; UWUA, CIO, 9; and no union, 142.

Rates—Gulf States Utilities gets an average of 15.8% rate hike in Navasota and Orange, Tex.

At opening sessions of National Citizens Conference on Planning and Resources in Louisville, Ky., TVA's Chairman Gordon Clapp says that "In 1933 there were only 225,000 residential power consumers in the area, with an average annual use of 600 kwhr apiece, whereas today there are almost 1,250,000 consumers with an average annual use of over 3,700 kwhr."

At Consolidated Edison's annual stockholders meeting, Chairman Ralph Tapscott says the New York PSC now is scheduled to consider the company's electric rate case on May 27 for fixing of a "final" rate schedule.

Westinghouse Electric Corp gets order from TVA for two 220,000-kva three-phase power transformers to be installed at new Colbert station. Largest ever to be built by company, units will be oil and air cooled, FOA, and will be rated 55 C rise. High-voltage winding will be rated 161-kw wye, with plus three and minus one 2½% no-load taps. Low-voltage winding will be rated 19-kv delta . . . Westinghouse Electric Corp breaks ground for $6 million steam and gas turbine development laboratory in Philadelphia.

In adopting stringent rules and regulations governing the use of county roads by REA projects, Duval County, Fla., County Commissioner Robert D. Gordon says: "REA is just some of this government alphabet soup we've been forced to eat for years. It is another example of a private company fattening itself upon governmental subsidies. It seems that this sort of thing is carrying us toward socialism, and personally I don't want to go that way."

Congratulations—Great Lakes Power Corp promotes Lynn Hollingsworth from executive vice president to president, succeeding John A. McPhail who becomes chairman of the board and chief executive officer.

THE ELECTRICAL WEEK

CONTINUED

More from Washington—USBR is draining water from 29 of its reservoirs in 17 western states to make room for heavy water run-offs. This means sacrificing power in favor of flood control . . . House passes $55-million supplemental appropriation bill for Department of Agriculture and Army Corps of Engineers to carry on emergency flood relief work in Mississippi and Missouri River basins.

"It is true that the rise in electric demand has developed some softness in recent weeks," American G&E's Pres Philip Sporn told the annual stockholders meeting. He said, "We are studying this now and this study may show a reduction in our 1954 peak demand of even as much as 200,000 kw." But, he continued, this would still not result in excessive reserve, particularly when we may at any time face full mobilization of our national resources and with it a very heavy increase in the demand for electric power on the system.

Pennsylvania Electric gets PUC approval to boost rates by $3,588,000 annually . . . Cincinnati G&E and IBEW, AFL, agree to 9 to 11¢ an hour wage increase . . . Montana-Dakota Utilities buys site at Mandan, N. D. for new plant.

IN THE INDUSTRY

George M. Gadsby, president of Edison Electric institute, in his straight-from-the-shoulder talk at the annual PUAA convention (EW, May 19, p 122) gave as one reason for the industry's low status in popular opinion, inadequate advertising and public information appropriations. Was his charge justified?

Anyone who wants the answer may determine it for himself. There is now available from William B. Hewson, vice president of Brooklyn Union Gas Co, Brooklyn, N. Y., the "Analysis of Utility Advertising and Public Relations Expenditures, 1951." This booklet gives the results of the sixth annual survey on this subject. Hewson was chairman of the Public Utilities Advertising Association committee that made it.

Data Supplied by 169 Companies . . . The report doesn't give exact figures or mention names. But it does contain a lot of useful data. These were supplied by 169 electric, gas, and combination companies serving 55% of all the electric and 71% of all the gas users in the United States.

Significant facts were these:

1. Average advertising expenditures per customer for all utilities were 73¢ in 1951 against 70¢ in 1950. Electric companies spent 85¢ in 1951 and 82¢ in 1950. Combination companies spent 66¢ and 64¢. But gas companies gave their expenditures a sharp boost of 9¢ to 77¢ from the 68¢ spent in 1950.

2. Average advertising expenditures as per cent of gross revenue was the same for all companies as it was in 1950, 0.62%. Electric companies spent a bit less 0.58% as compared with 0.59% in 1950. Combination companies reported identical figures. But gas company expenditures of 0.83% were up 0.06% from 0.77% in 1950.

3. In 1952 electric companies expect to spend 5% more on advertising than in 1951, combination companies 5.3% more, gas companies 4.8% more.

4. Appliance sales advertising will get more attention in 1952 than in 1951. Institutional and promotional budgets also will be larger.

All Expenses Considered . . . The survey is valuable because it includes all expenses including salaries, exhibits, employees house organs, annual reports, agency commissions, and office supplies as well as those for the usual advertising media.

Most of the advertising and public relations managers of the larger companies are members and supply data. They use it as a guide in setting up their budgets. The industry can use it to determine whether or not its advertising and public information appropriations are adequate.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Hiring one research man puts several thousand on the staff. The recruit taps all the fruits of all the others for his employer's benefit—Sarnoff of RCA.

Sahara Desert is one of the largest potential oil areas of the globe. Scarcity of water has prevented exploratory drilling up to now.

Furnace has been designed to operate at 3,500 F to treat high temperature alloys for jet engine use.

Street lights at 35-ft height may give better street illumination but they also require a longer and unsteadier ladder to reach them for maintenance.

Trenchers and pole-hole diggers can throw rocks large enough to injure a man. The remedies are (1) to install a guard or (2) have the operator and ground crew stand in the clear.

Man-saving equipment is good to buy at the same time as the labor-saving equipment. Example: steel toe caps to accompany an air-hammer or pavement breaker.

Residential customers of one utility could expect a 50% reduction in rates if the company were relieved of its tax burden.

Copper-equivalent sizes for aluminum are favored by a fair majority. Why? How many ac circuits are calculated on mere resistance drop?

Street railway currents usually masked other stray currents; abandonment of electrified tracks often have given the latter their destructive chance.

Steel slabs can now reportedly have copper cast on their surfaces for rolling into composite sheets, plates, and strips.

Where Do You Get 1.8 Million Kw?

- **Atomic Energy Commission has three choices for supplying its proposed gaseous diffusion plant in the Ohio Valley**
- **15 private companies headed by AG&E group have submitted first firm proposal: The commissioners are looking it over**

The Atomic Energy Commission is considering three alternatives for supplying electric power needs of its proposed gaseous diffusion plant in the Ohio Valley. A power capacity of 1.8 million kw will be needed to supply this single AEC load (EW, April 21, p 110).

No decision on the three alternatives is expected before July. Congress last week received the AEC expansion budget, and must approve construction of the gaseous diffusion plant before contracts can be signed.

The three alternatives:

- A group of electric companies would build and operate the power plant selling power to AEC on a contractual basis.
- Tennessee Valley Authority would supply all or part of the power requirements.
- AEC would build its own power plant.

Only formal electric power proposal thus far received by AEC is one submitted by a group of 15 electric companies which serve the Ohio Valley area. No details of the proposal had been released last week, but it is understood to be fairly comprehensive—providing for construction of either one or two steam plants with a total installed capacity of 1.8 million kw.

On the River . . . The power plant or plants would be located on the Ohio River in the vicinity of the AEC plant. For contractual purposes, it is figured the gaseous diffusion plant would have a 95% load factor. Energy sales would run in the neighborhood of 15 billion kwhr a year.

Likewise, the exact rate offered AEC by the 15-company combination is still secret. However, it is a fair guess that it will be slightly above the 3.6 mills per kwhr which AEC will pay at Paducah, Ky., for energy to be supplied by the Electric Energy, Inc, plant being built by an electric company group.

In a number of respects, the power proposal resembles the contract now in effect between Electric Energy, Inc, and AEC. For instance, AEC is asked to guarantee a market for the power for a certain number of years. If the contract should be terminated by AEC prior to the guaranteed date, a settlement would be made.

The Fifteen . . . Electric companies offering the single proposal include:

American Gas & Electric Service Corp of New York, Ohio Power, Indiana & Michigan Electric, Appalachian Electric Power, Cincinnati Gas & Electric, Kentucky Utilities, Cleveland Electric Illuminating, Public Service of Indiana, West Penn Electric, Louisville Gas & Electric, Indianapolis Power & Light, Ohio Edison, Dayton Power & Light, Southern Indiana Gas & Electric, and Toledo Edison.

Last week in New York, Philip Sporn, who as president of American Gas & Electric Co headed efforts to put the 15-company plan together, called it the "greatest single power supply undertaking which has been studied or projected by any company or group of companies in the entire history of the electric power industry."

Three of the companies—Appalachian Electric, Indiana & Michigan, and Ohio Power—are AG&E subsidiaries. The subsidiaries, Sporn said, would participate to the extent of 37.8% in the 15-company plan. This is equivalent, he pointed out, to 680,000 kw—greater than the largest plant in the AG&E system.

Proposal From Tennessee? . . . TVA is known to be preparing estimates in connection with a proposal to supply the gaseous diffusion plant. This agency is already familiar with AEC work. It is supplying part of the Oak Ridge, Tenn., load and is constructing a plant to supply part of the Paducah Plant load.

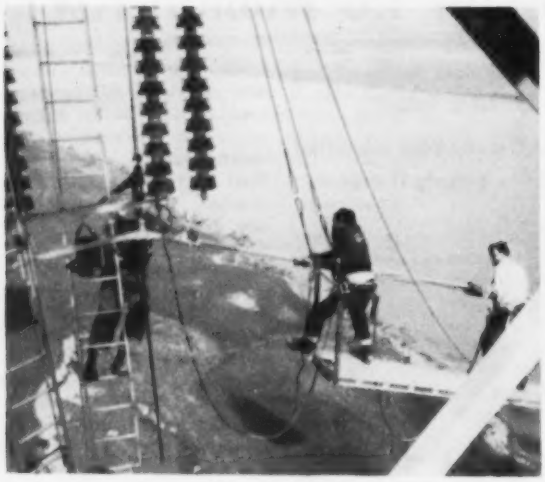
While the proposed Ohio Valley AEC plant would be considerably beyond the limits of the present TVA service area, the agency apparently was requested to submit a proposal. Since the TVA Act limits the service area to the longest feasible transmission distance from a TVA hydroelectric project, it would seem that some amendment to the act would be required if TVA is to supply power to be proposed AEC plant.

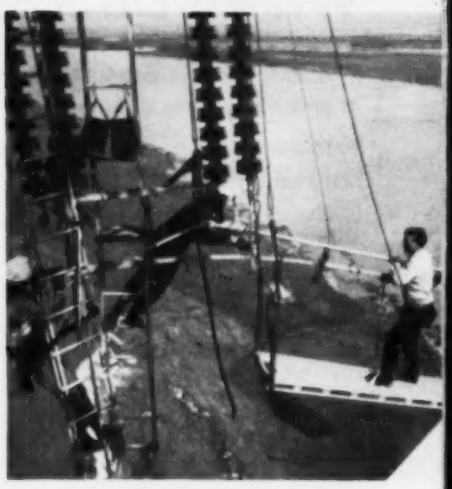
Third alternative is for AEC to build its own power plant. Just how far planning has progressed along this line is not known. It is believed this is a "last resort" alternative, and the agency will only build its own plant if it is impossible to enter into what it considers to be a fair and reasonable contract with other power suppliers.

Depa Deputy

Edwin Jason Dryer, general counsel for Defense Electric Power Administration, will become deputy administrator of that agency June 2. He replaces John D. Davis, who will become assistant administrator of Bonneville Power Administration.

Dryer joined Depa in November 1950 as general counsel and assisted in setting up the agency. A graduate of Yale Law School, he received his LLB in 1940. After five years in the army, he set up a law practice in Salt Lake City. He later joined BPA as assistant general counsel, leaving to join Depa.





Linemen's footing is precarious . . . . . on steel tower . . .

CENTRAL VALLEY PROJECT tower seen from across half-mile-wide river

. . . 400 feet above the Sacramento River

Spectacular aerial work by linemen making a crossing of the Sacramento River in California marked the completion of Central Valley Project's 230-kv line from Shasta and Keswick power plants to Tracy.

In this picture series, highliners are installing protective armor rod on conductor spanning the half-mile-wide river. To accomplish the crossing, 437-ft steel towers were constructed on either side of the river, making a span of 3,800 ft.

Reclamation's 230-mile, double-circuit line will supply energy to the Tracy pumping plant and Tracy switchyard, load center for CVP-developed power. Line will be energized shortly.

San Joaquin River also had to be spanned, and for this job, 337-ft towers were set up 2,300 ft apart.

Trinity River Plan Studied

Reclamation offers detailed proposal to use up surplus water flow in northern California for power and irrigation

A Bureau of Reclamation proposal to use presently wasted surplus waterflow in northern California's Trinity River to provide additional water for Central Valley Project and power for the north and central regions of the state is being studied by federal agencies and California and Oregon officials.

The project would provide more than 1.6 billion kwhr of power annually and an additional million acre-ft of water. Review by state and federal agencies precedes submittal of the plan to Congress.

Engineering features of the proposed water resources development are:

● Trinity Dam, estimated cost $79.8 million, on main stem of Trinity River, nine miles above Lewiston, 410 ft high and 3,300 ft long at the crest. The dam would impound a reservoir 17 miles long, with a capacity of 1.8 million acre-ft of water.

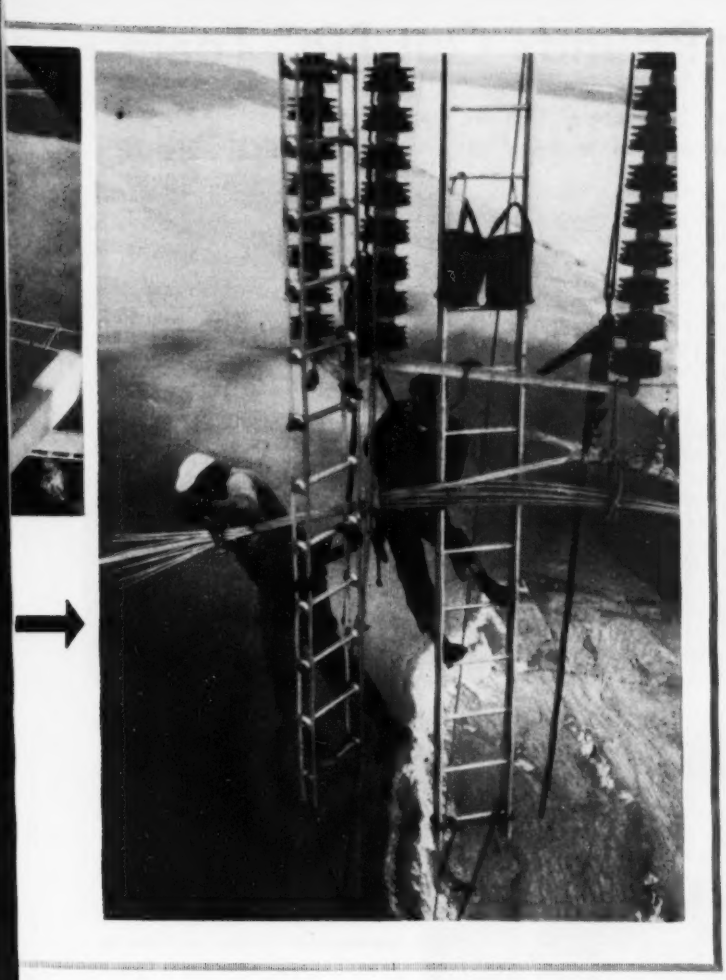
● Trinity Power Plant and Switchyard, $12,625,000, at right abutment of dam, with a capacity of 75,000 kw.

● Lewiston Diversion Dam and Reservoir, $5,660,000, on the main stem of the river nine miles downstream from the main dam. Dam would be 140 ft high, and back up a lake of 45,000 acre-ft capacity.

● Lewiston Power Plant, $574,000, with 2,000 kw capacity, at left abutment of Lewiston Dam.

● Tower House Diversion Tunnel, $28,930,000. It would be 8.3 miles long, diverting from Lewiston Dam to Tower House Power Plant on Clear Creek. The tunnel would be 14 ft, 7 in. in diameter and could carry a flow of 1,700 cu ft per sec.

● Tower House Power Plant and



Switchyard, $9,270,000, on Clear Creek, with a capacity of 66,000 kw.

● Tower House Diversion Dam and Reservoir, $1,214,000, on Clear Creek, serving as afterbay for the Tower House Power Plant and forebay to divert water into Matheson Tunnel. Dam would be 48 ft high and 810 ft long.

● Matheson Tunnel, $29,705,000 diverting from the Tower House Diversion Dam. The 8.7 mile tunnel would be the same size and capacity as the Tower House Tunnel.

● Matheson Power Plant and Switchyard, $8.6 million, with a capacity of 75,000 kw, located on the western shore of Keswick Reservoir on the Sacramento River.

Other features of the program will result in a total estimate project cost of $207,334,000. Except for a small sum required for fishery preservation, all of that amount would be repaid to the government from power and water revenues.

Line Case Goes to Court

Detroit Edison Co is asking court help to get a transmission line erected across the property of a householder. The building of the line has been stalled since January by the refusal of the owner to let the utility's tree-cutting crews work on the property, between Marysville and St. Clair.

There's a Plus . . .

. . . in utility stock, but it's got to be pointed out to prospective buyers, NJUA hears

"It is surprising how many there are who are not conscious of the fact that the investor must see some advantage if he is to buy utility securities," Tom P. Walker, vice president, Irving Trust Co, said in a recent address before the New Jersey Utilities Association Spring Meeting at Absecon, N. J.

Walker in discussing the subject "Sound Earnings—The Key to Investor Support" said that generally the investor favors utilities above other industries. Registration statements and reports to regulatory authorities, while costly and onerous to the companies, have produced considerable confidence in the mind of the sophisticated investor.

"Clouds will appear," he continued. One is "the decline in earnings per share of common stock"; a second is "the temptation to weaken capital structures by over-emphasis on debt," and a third is "the debilitating effect of inflation on the investment dollar."

No Formula . . . Pointing out there is no magic formula for a proper balance among debt, preferred, and common stock and all other securities that constitute financial structures, Walker told his audience, "You should have some properly balanced goal toward which each move you make is directed."

Sole purpose of the Niagara River development is to generate and sell electricity, said Gustav F. Watters, vice president of Niagara Mohawk Power Corp. Outlining how the group of five utility companies have offered to pool their resources for constructing and operating the development, he said, the companies serve a population of 13.6 million people, or about 90% of the population of New York State, residing in an area of some 43,000 square miles; in 1951 the companies paid $161 million in federal, state and local taxes; nearly 45,000 people are employed and the annual payrolls aggregate $182 million; about a quarter of a million stock holders reside in every state in the nation; and the companies have been assured of their ability to do the needed financing.

Dale E. Doty Rounds Out FPC Team

Commission can hang out "no vacancy" sign for first time since October, when Chairman Mon Wallgren left

Federal Power Commission is fully manned again with the swearing in last week of Dale E. Doty, who transferred over from the Interior Department.

This for the first time since former Chairman Mon Wallgren left last Oct. 1, FPC is a five-man commission. Doty, a close acquaintance of Interior Secretary Oscar L. Chapman, has been serving as Assistant Interior Secretary for public land management since June 1950. He first came with Interior in March 1939 under an intern-training program.

Doty, a native Californian, was unanimously confirmed by the Senate for his FPC post. He had previously received a unanimous confirmation when he moved up to become Assistant Interior Secretary.

At a hearing just before his confirmation, Doty told the Senate Committee on Interstate and Foreign Commerce he was not committed to development of public power as against private power (EW May 19, page 123).

"I feel we need the power, and all the power we can get no matter who develops it," Doty said.

At 37, Doty is the youngest member of the present commission, and possibly he is the youngest man ever to serve as a full-time commissioner with FPC.

Although Doty has backed Interior Department federal power projects, he goes to his post with FPC with no commitments.

Observers guess he will side with Chairman Thomas C. Buchanan on most FPC decisions. But where he stands will be seen from his voting on future FPC business.

(*Cover Story*)

Among the more troublesome issues on which Doty will have a chance to vote are:

Applications for rate increases filed by natural gas pipeline companies.

Applications for hydroelectric project licenses filed by electric companies. One of the more controversial is the Ox Bow project in Idaho, which Idaho Power Co wants to build as part of an alternative to the huge Hells Canyon development Interior Department has proposed (EW, April 7, p 94).

There is also the chance that two FPC-Interior fights now before federal courts will eventually be dumped back into the commission's lap—the Roanoke Rapids case and the Kings River case. In both, Interior is seeking to void licenses granted by FPC.

On the Spot . . . The open row between FPC and Interior puts Doty in a hot spot. His action on cases involving the two agencies will be watched closely by advocates of both public and private power.

Doty majored in business administration, receiving his AB degree from Pomona College in 1936 and his MA from University of Cincinnati in 1938. He received an LLB from George Washington U. in 1948.

Coming to Washington in 1939 Doty served as a research assistant in the land classification division of Interior's general land office. From 1941 to 1943 he was a land economist in the same bureau. In June 1943 he became administrative assistant to Chapman, who was then Assistant Interior Secretary. Since that time, he has climbed the departmental ladder under Chapman's guidance.

And Steel They Have No Poles

The women of the Lakeside Plaza residential section of Long Beach, Cal., say they've been promised ornamental steel light poles, and they're not going to let those plain wooden ones go up. Here they're shown filling in a post hole—elsewhere they parked cars over creosoted poles, forcing workmen to leave.

The dispute arose when Aldon Construction Co, subcontractor for Southern California Edison Co, started to install wood poles in the tract. When the women protested, Aldon Co spokesmen said they had no control over the type of pole installed, and asserted Edison had promised steel ones. Edison retorted that while wooden poles would be installed free, steel poles would cost someone —not Edison—$132 each.

Sangamo J Meters

make friends of power company customers

Outdoor metering has brought about a big improvement in company-consumer relations. It has eliminated annoyance to the consumer and has reduced expense for the power company.

Outdoor metering is no problem with Sangamo J Meters. They are fully compensated for all temperature extremes and accurately measure all power delivered at sub-zero or torrid temperatures. They are designed to maintain the proper physical relationships of all parts under all conditions of changing temperatures and vibration.

J Meters are quiet in operation even under the most adverse conditions.

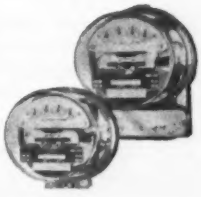
J Meters are accurate. Not one case has been reported of a Sangamo J Meter speeding up in service due to loss in damping strength. Since the damping magnets control the speed of the meter, accuracy depends upon the permanence of their strength. Because the alnico damping magnets, used in J Meters, are unaffected by extreme operating conditions, they completely eliminate over-registration with resultant "high bill" complaints.

Only Measured Facts are Known Facts

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

SM52-7

Sangamo J Meters have proved their ability to meet today's requirements and tomorrow's anticipated loads with sustained accuracy, economy of maintenance and troublefree performance.



ALLIS-CHALMERS

Low-Cost 5/8% Step Distribution Regulator Line Extended

Now you can get time-tested pole-type JFR 5/8% step voltage regulators for any application

THE INITIAL COST of regulation has been reduced for many feeders by the extension of the Allis-Chalmers JFR 5/8% step regulator line to cover five new ratings. Now the advantages of voltage regulation can be brought to marginal lines where equipment costs were too high before.

Even though the price tag is low, with JFR 5/8% step voltage regulators you get all the features of Allis-Chalmers 5/8% step regulation. Voltage is regulated in a narrow ± 1 volt band in 32 small 5/8% steps over 20% range. And now the line covers five new ratings: 100 amps rated 7620 volts; 50 and 100 amps rated 5000 volts; and 100 and 200 amps rated 2500 volts.

Increase Revenue, Cut Complaints

These new ratings provide new low-cost opportunities to increase revenue through closer voltage regulation. Loads can be increased. Lines can be extended into fringe areas at minimum expense.

At the same time that revenues are increasing through closer voltage regulation, customer complaints are being sharply reduced. No more poor lighting, slow cooking, or burned out motors due to poor voltage. You get more customer goodwill — while the regulator pays for itself out of increased revenue!

Maintenance Costs Cut

The Allis-Chalmers JFR 5/8% step voltage regulator is easy to mount and maintain. The same jump-proof mounting brackets used on distribution transformers make mounting simple. And the regulator's design simplifies maintenance.

The regulator is easily accessible because it is cover-suspended. All you need to do to lift the regulator from the tank is remove the cover clamps.

The unit-type control is grouped on a single control panel. All that is needed is to loosen the hasps and slide the control tank down to mechanical stops. Then, adjustments are easy. Just set two knobs. Voltage level and voltage band can be set in less than 60 seconds.

A heavy driving motor operates under oil for tap changing. It is thermally self-protected and will not burn out. There are no commutators, slip rings, brushes, or centrifugal switch.

Get Full Story

Get the complete story on how you can cut initial cost and maintenance of voltage regulators with the Allis-Chalmers JFR 5/8% step voltage regulator line. Call your nearest Allis-Chalmers district office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3741

Since 1933, with the introduction of the first 32-⅝% step voltage regulator, Allis-Chalmers has led the industry in providing better, more accurate regulation at lower cost. Nearly every year since then, an Allis-Chalmers "first" has improved regulation, reduced costs, or simplified maintenance. These developments have in many cases become standard throughout the industry. Since 1933, distribution and transmission engineers have depended on Allis-Chalmers for the best and most efficient voltage regulation. Allis-Chalmers ⅝% step regulators have proved themselves in nearly twenty years of successful operation.

Since 1949, with the introduction of the first pole-type ⅝% step distribution regulators, Allis-Chalmers has provided new possibilities in reducing costs of regulation. The low-cost pole-mounted ⅝% step distribution regulator has made it possible to bring regulation to distribution feeders where it could never be afforded before. Now, with the extension of this distribution ⅝% step regulator line to cover every needed range of regulation, the advantages of low-cost regulation can be applied to nearly every feeder. Both revenues and customer goodwill can be increased at the same time.

Ratings now available in the Allis-Chalmers JFR ⅝% step voltage regulator line:

7620 volts	15 amp
	50 amp
	100 amp
5000 volts	50 amp
	100 amp
2500 volts	100 amp
	200 amp

ALLIS-CHALMERS

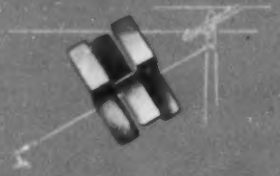
Originators of ⅝% Step Regulation

A-C ALLIS-CHALMERS

Increase Efficiency... Reduce Maintenance With KEARNEY Pole Line Equipment Designed to Help Your Linemen Do a Better Job FASTER!

Dead End Self-Supporting Bare Neutral Service Cables with the KEARNEY WEDGE-TITE CLAMP

The Kearney Wedge-Tite Clamp is built with a serrated wedge that grips the bare wire with a force proportional to the strain put upon it. This strain is not transmitted to the insulated conductors thus eliminating insulation creep and the danger of leakage and shorts.



Serve Guy Wire Strand Ends Permanently with the KEARNEY FINGER GRIP GUY CLIP

To use this clip no special tools are required and it is impossible to position incorrectly. These clips are easily inserted between the strands and tabs are bent around the wires. Clip is made of aluminum and will outlast the strand itself. Faster and neater than using waste strand.

Seal Out Oxidation and Corrosion on Any Connection with KEARNEY AIRSEAL

Kearney Airseal is a pliable high-dielectric compound which is chemically inert. It is the most nearly perfect material on the market today for sealing out moisture, oxidation and corrosion. Airseal is applied by kneading it over the terminal or connector to be protected, forming a protective coating impervious to moisture and contaminated atmospheres. For any connection protection problem—investigate Kearney Airseal.

Eliminate Radio Interference— Use KEARNEY NON-STATIC GROUND WIRE CLIP

Ordinary staples are entirely inefficient in securing ground wires because the contact pressure is dependent upon their hold in the wood and loosening causes air gaps to develop between staple and ground wire. These air gaps cause radio interference.

The Kearney Non-Static Clip completely eliminates the air gap and resultant interference because the pressure between the clip and wire is entirely independent of the clip's grip in the wood.

JAMES R. KEARNEY CORPORATION
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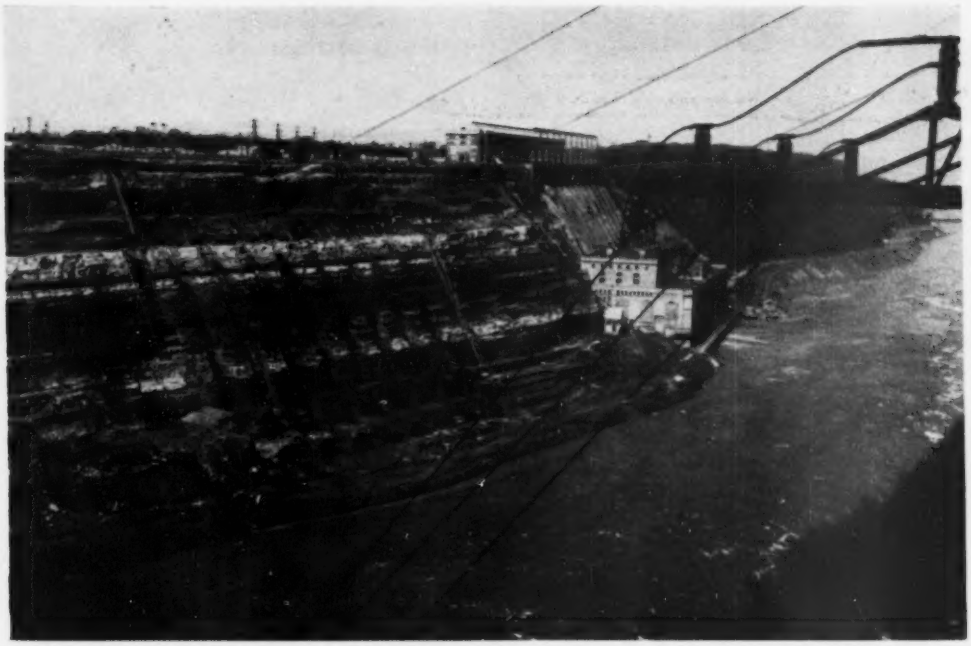
KEARNEY Gives a Little More for a Little Less

Through Engineering



ONTARIO HYDRO'S SIR ADAM BECK STATION NO. 2 is being cut into the 300-ft escarpment rising above the Lower Rapids of the Niagara River. Seven 75,000-kw units are being installed to go on the line by 1955. Another five generators may be installed later

From the American side of the river, the looks are likely to be envious as . . .

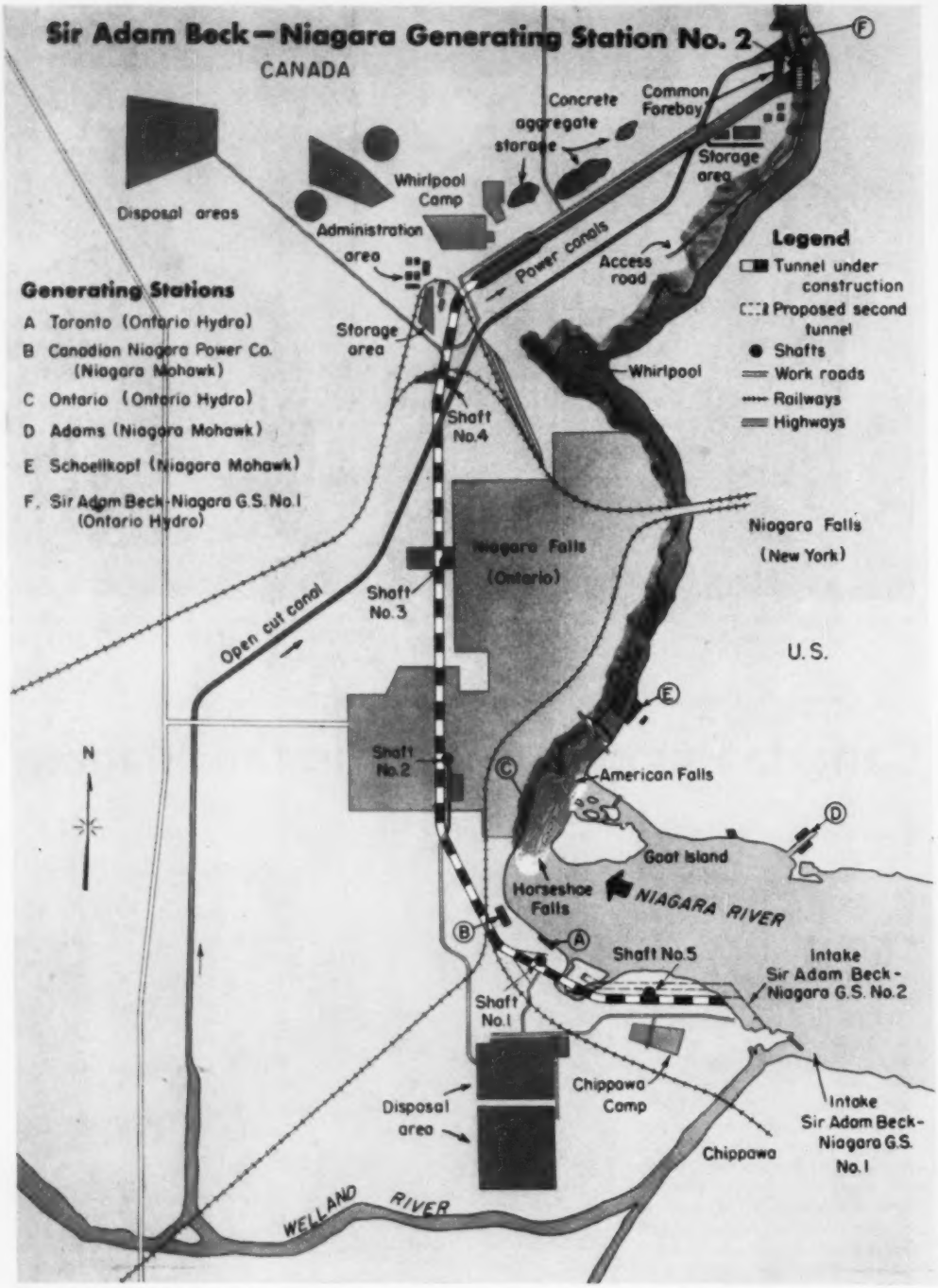
Canada Plunges Ahead on the Niagara

Niagara Falls, Ont.—Through a tunnel under this small Ontario city, into an open cut canal leading to the brink of the escarpment above the Lower Gorge, finally to plunge 300 ft to the turbine pits below: Thus will waters of the Niagara run to make power when Ontario Hydro completes its greatest project.

That project is the building of Sir Adam Beck Station No. 2, made possible by the signing of a new Niagara River diversion treaty between the United States and Canada in 1950. The station will take the additional water provided for under the treaty and use it to generate 900,000 kw when all 12 units are in. This will double existing capacity and ease the province's critical shortage of power.

Seven units have already been authorized—the first four to come on the line in 1954, another three in 1955. First lateral boring in the 5½-mile tunnel began last month, and the first

HYDRO'S CHAIRMAN SAUNDERS often races down from Toronto at the wheel of his Cadillac to see how project is coming along. Here he is shown (third from left) on escarpment above plant excavation with James Blay, public relations director; William L. Frazer, field project engineer, and William McD. Hogg, his assistant. Sir Adam Beck station No. 1 is in background



CANADIAN REDEVELOPMENT of the Niagara will divert water from above Canadian Falls (bottom right) into 5½-mile tunnel and 2½-mile canal and finally to Sir Adam Beck Station No. 2 (top right). Under a new treaty, remedial works will be built above the falls to preserve their beauty. A second tunnel will be built 250 ft east of the first, using the same access shafts, once all 12 units are authorized

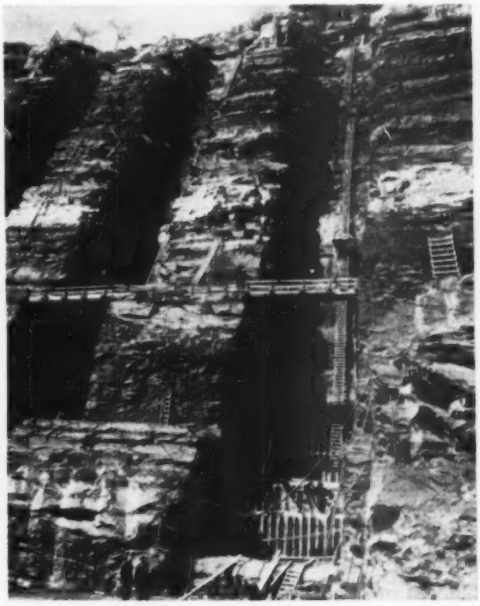
Men and machines work to build intake and tunnel

French Canadians are shown working (above, left) on cofferdam at the end of intake's 500-ft gathering tube, which takes advantage of main current in river. Huge power shovel at right was dismantled and reassembled 204 ft underground for excavation work in shaft No. 4

permanent concrete—in the foundation of Penstock No. 1—was poured. The 2½-mile canal is half completed, and intake works two miles above the Canadian Falls are well under way.

In fact, there's a good chance that the first stage of the project will be finished before one power shovel full of earth is turned to bring in an equivalent power potential set up by the treaty on the American side of the Niagara.

In the United States, politics—the private power-public feud to be specific—continues to stymie redevelopment of the Niagara (EW, Oct. 8, 1951, p 104). The federal government wants to build it, the New York Power Authority wants to build it, and five private companies in New York State want to build it. No work can be done until Congress gives one party the go-ahead. And Congress isn't going to make any such politically dangerous



Water will flow here . . .

. . . and drop 300 ft here

Canal will run unlined through rock, with exception of 2,200-ft stretch across ancient gorge filled with glacial debris, where water will flow in trapezoidal concrete trough. First permanent concrete was recently poured (right) at base of project's No. 1 penstock trench

A million tons of earth were moved

Excavation at the powerhouse site is nearly complete, and concrete pouring has begun. With eight units, station will be 570 ft long; with 12 units, 830 ft. Double-lane access road had to be built down the side of the gorge. Camera looks down-rapids toward older plant

decision in a major election year.

The question of who would develop the Canadian side was settled back in 1906 when the Hydro-Electric Commission of Ontario was set up. According to Robert H. Saunders, its chairman, the commission was organized at the request of business men and industrialists who wanted to preserve the water resources of the province for the benefit of the people. Since that time, all the commission's projects have been financed by money borrowed from private investors. When the present Niagara treaty was signed, Hydro became the natural agency to handle the Canadian end.

Determinant . . . Surprisingly, what the U. S. decides to do at Niagara will have less effect on the Canadian development than what the U. S. decides to do about the St. Lawrence Seaway and Power Project. Congressional action or inaction on the St. Lawrence will actually determine the timetable for completion of units in Sir Adam Beck Station No. 2.

The point is that power from the St. Lawrence would be even cheaper than that from Niagara. So the commission wants to build a hydro dam across the St. Lawrence before it goes ahead with the last five units at Sir Adam Beck.

William McD. Hogg, assistant field project engineer, explained it this way:

Hydro will have a critical shortage of power by 1956. In that year, demand is expected to exceed capacity —unless either the St. Lawrence or the full Niagara project comes on the line. As things stand, it probably will require at least five or six years to get power out of the St. Lawrence. If Hydro *could* get St. Lawrence power sooner, it would prefer to build there and come back later to install the remaining units at Niagara. But it's fairly certain all the Niagara units could be installed by 1956.

"So it looks now as though we'll have to go ahead with the 12 units immediately," Hogg said.

Saunders on Power . . . Chairman Saunders was interviewed recently on the escarpment overlooking penstock excavations for the new power plant.

"That will be gold," he said, pointing to the waters rushing toward Lake Ontario in the gorge below, "once we get the St. Lawrence. And we'll get it—it will be just a matter of time."

But if the St. Lawrence or the total Niagara project doesn't come through on schedule, won't Hydro have to turn to steam?

"We may have to go to steam eventually," Saunders said. "But we have pretty firm supply on the Niagara—even more so on the St. Lawrence. And there are still some large hydro sites left on the Albany River, although there it's a question of long distance, high voltage transmission."

Won't there be any power left to develop on the Niagara?

"When all 12 of the Sir Adam Beck units are in, we'll be using up all our treaty power—2 million kw."

Does Hydro have any plans for interchange of power with the U. S., once the Niagara project is finished?

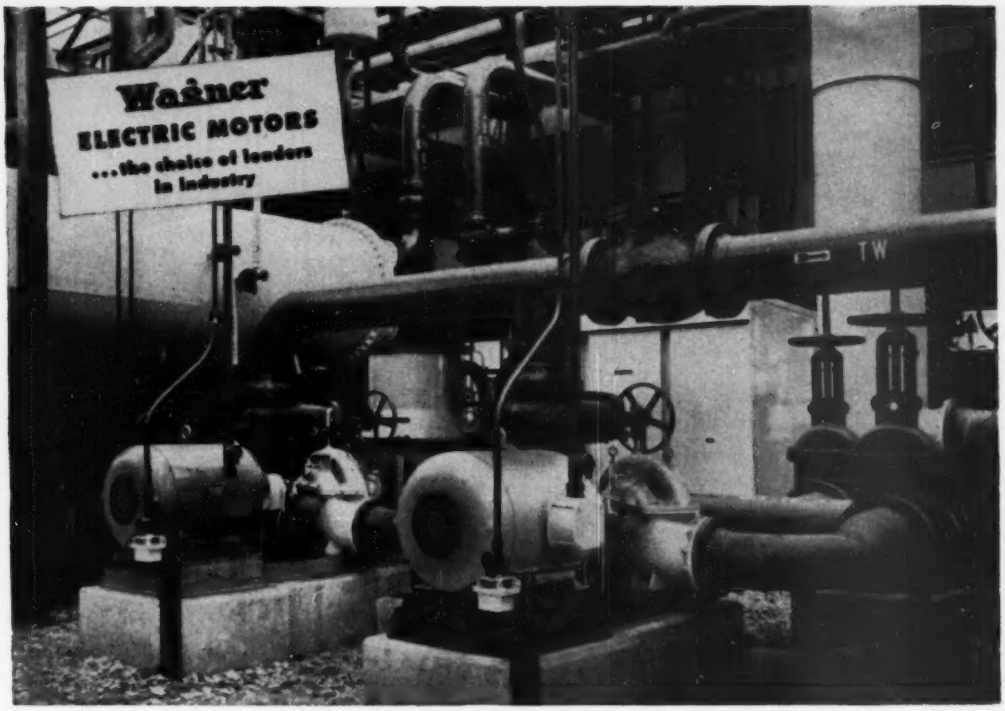
"We hope to export it—offpeak power, mostly—but that will depend on treaty arrangements with the U. S. I don't think I'm breaking any confidence when I say that one of your own companies asked for any surplus energy we might have when the St. Lawrence development is operating."

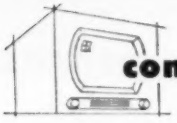
The Grand Plan . . . Ontario Hydro has worked out an ingenious engineering scheme to use the additional water made available by the 1950 treaty. Tunnel and canal make it possible to use 295 ft of the 315-ft drop between intake and powerhouse.

The intake will divert 20,000 cu ft a second from the river at a point two miles above the Canadian Falls. From there the water will drop 330 ft in the inverted-siphon type tunnel, which will have a finished diameter of 45 ft. It will resurface 5½ miles away and flow into an open cut canal being dug 200 ft wide and 70 ft deep to handle all the water that will be needed when the full 12 units are in. A second tunnel, using the same access shafts as the first, will have to be built when the second-phase units are installed.

Near the forebay the canal crosses that of the first Sir Adam Beck station at grade in a unique "X". Flow in the two canals is redistributed at this point, and again at an interconnecting canal linking the two forebays (see map). From there the water will drop through penstocks to the seven 75,000 kw, 60-cycle units in the power house below.

The commission had to build "Hydro City"—three construction camps —for nearly 5,000 workers engaged at the project. The facilities were moved bodily from Hydro's last big construction job—Des Joachims on the Ottawa River. And already the men are looking toward their next likely move—following the waters of the Niagara through Lake Ontario to the St. Lawrence.





complicated—yet clear as crystal

True optical clarity is but one of the many attributes of Plexiglas, the acrylic plastic that is permanently transparent, strong, light in weight, and that can be molded, formed, or machined. But the manufacture of Plexiglas is a highly complex operation.

The Rohm and Haas plant in Texas, for instance, uses natural raw materials found nearby to manufacture chemicals, which in turn are processed into Plexiglas at still other Rohm and Haas plants—all part of a production chain . . . the kind that makes America great.

In the Deer Park, Texas, plant of Rohm and Haas, Wagner electric motors and Wagner transformers are an essential part of this production chain. The 75 horsepower Wagner Explosion-Proof Motors (illustrated above) get the power to drive them from Wagner transformers in the low voltage substation, stepped down from the 2400 volts of electricity delivered by Wagner transformers in the main substation, where energy is received at 69,000 volts. Small Wagner air-cooled transformers are also used inside the plant to furnish 120 volts for lights and other single-phase loads.

Wagner engineers are qualified to specify the proper motors and transformers for *your* requirements as well. Consult the nearest of our 31 branch offices or write us.

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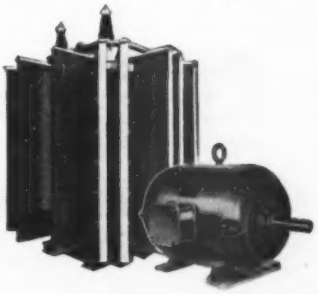

Wagner Electric Corporation EST 1891

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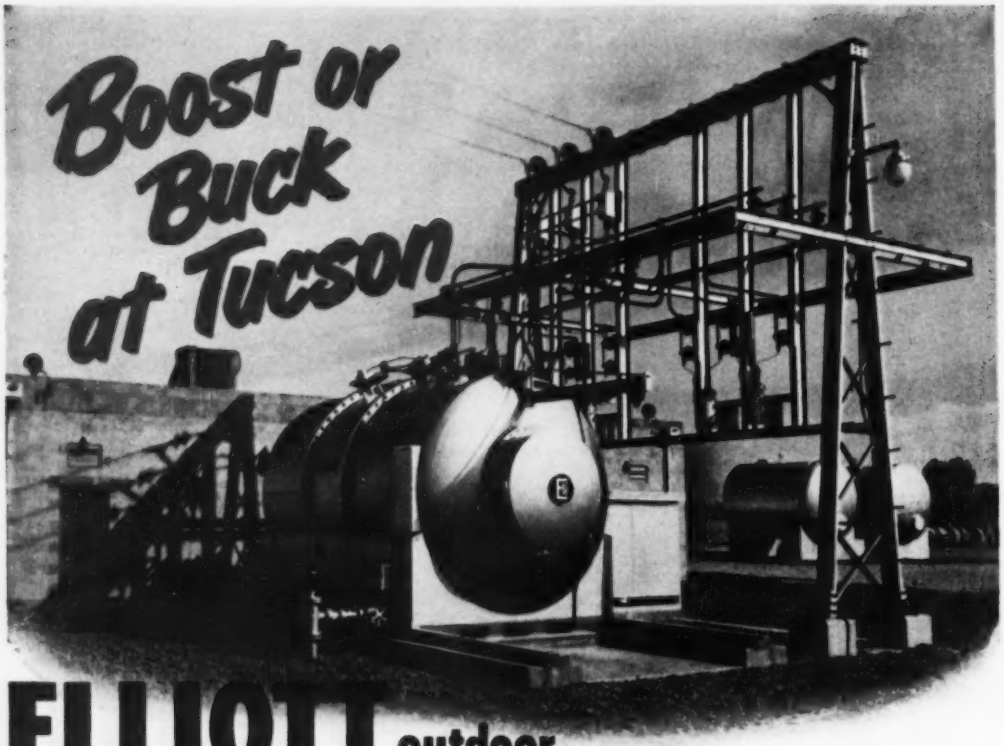
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC



ELLIOTT outdoor
hydrogen-cooled synchronous condenser

. . . serves the distribution system operated by the Bureau of Reclamation, Tucson, Arizona. This versatile machine is designed to deliver either leading or lagging kilovars.

Rated for 0.5 psi hydrogen pressure, this machine delivers 20,000/8,400 kva, 13,000 volts, 720 rpm. Operated at 15 psi hydrogen pressure, this condenser will deliver 24,000 kva, 0 pf leading.

Noteworthy Features...

[redacted]

Extended soleplates for rollers to facilitate movement of end domes and stator. Crane-boom on end dome with two-ton hoist to remove bearings, etc. through door.

[redacted]

Clean lines, no unsightly pipe connections, no protruding terminal boxes, no waste area.

[redacted]

Gas-to-water heat exchanger in each dome. Carefully-engineered, positive-action fans at both ends of rotor.

[redacted]

Parts proportioned to insure efficient utilization of materials, and streamline flow of cooling gas contribute to loss reduction.

[redacted]

Access to machine and exciter brushes is through hinged exciter cover in end dome.

ELLIOTT Company

Ridgway Division
RIDGWAY, PA.

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AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES

EEI Plans 20th Annual Parley

Institute's convention is set for June 2-4 at Cleveland. Charles A. Coffin Award winner will be announced

When the Edison Electric Institute holds its 20th annual convention this June, discussions will be held on the Niagara controversy, accident prevention, and the future of private power companies. The parley is scheduled for June 2-4 at the Cleveland Public Auditorium, Cleveland, Ohio.

The Niagara Story . . . The far reaching implications of the Niagara controversy will be pointed out by Earle J. Machold, president of Niagara Mohawk Power Corp. He will explain the serious threat made by public power sponsors, who would place the government directly in the power business at Niagara Falls, to private enterprise system as typified by the electric power industry.

"Are You Leading Your Safety Program?" is the topic Dr Walter A. Cutter, assistant director of the New York University Center for Safety Education, will discuss. Dr Cutter will describe successful plans and programming, showing how alert and continuing top-management interest can be projected into satisfactory accomplishment. In connection with this safety program discussion, a demonstration of the Oesterreich pole top method of resuscitation will be given by a line crew of the Cleveland Electric Illuminating Co.

Future of Private Power . . . The future of private power companies will be dealt with by J. E. Corette, vice president and assistant general manager of Montana Power Co. His talk will emphasize that continued fine service, efficient operation and good public relations by the companies, as compared with federal power's extravagance and inefficiency, will assure the future existence and success of power companies.

To Make Awards . . . George E. Whitwell, vice president of Philadelphia Electric Co and chairman of EEI's Prize Awards Committee, will conduct presentations of the Claude L. Matthews Valor Award and the Reddy Kilowatt Annual Report Contest Awards. The Charles A. Coffin Award will be presented Tuesday evening, June 3, at the Public Auditorium preceding musical entertainment furnished for delegates and guests through the courtesy of Westinghouse Electric Corp.

At 12 noon Tuesday, the Philco Corp will be host to the ladies at a luncheon in the Rainbow Room of the Carter Hotel and has arranged special entertainment features.

Electrical World is sending a staff of seven to publish the "Unconventional Daily." This will be the sixth year that EW has published the morning tabloid. It will carry the list of delegates and give complete coverage in word and picture of the convention.

ISO Schedules 1st U. S. Meeting for June 9-21

For the first time the International Organization for Standardization (ISO) will meet in the United States. The organization plans to hold its triennial meeting at Columbia University in New York June 9-21. The American Standards Association, U. S. member of the ISO, will act as host to delegates from the 32 member nations who will participate in the ISO General Assembly, which last met in Paris.

Fifteen ISO technical committees will hold meetings in connection with the triennial meeting and discussions on screw threads, limits and fits, bearings, iron and steel and preferred numbers.

NAED to Hear NPA Chief

Clarence Blumoehr, deputy chief of the wire mill branch of the Copper Division of NPA, will take part in the panel discussion, "Cooperation with Government Defense Agencies", planned for the 44th annual convention of the National Association of Electrical Distributors, set for June 8-12 at the Ambassador and Chelsea Hotels, Atlantic City, N. J.

CALENDAR

Missouri Association of Public Utilities
1952 Convention, Hotel Missouri, Jefferson City, Mo., May 27-28.

Pennsylvania Electric Association
Spring Meeting, Prime Movers Committee, Tidewater Inn, Easton, Md., May 28-29.

C.I.G.R.E.
(International Conference on Large Electric High-Tension Systems), 14th Biennial Session, Paris, France, May 28-June 7.

***Edison Electric Institute**
20th Annual Convention, Cleveland Public Auditorium, Cleveland, Ohio, June 2-4; Accident Prevention Committee, Sheraton Hotel, Rochester, N. Y., Sept. 15-16; Prime Movers Committee, Roosevelt Hotel, St. Louis, Mo., Oct. 6-7; Electrical Equipment Committee, Roosevelt Hotel, New York, Oct. 13-14; Transmission-Distribution Committee, Hotel Adolphus, Dallas, Tex., Oct. 23-24.

National Association of Electrical Distributors
44th Annual Convention, Hotels Ambassador-Chelsea, Atlantic City, N. J., June 8-12.

International Organization of Standardization
Triennial Meeting, Columbia University, New York, June 9-21.

Pacific Coast Electrical Association
Annual Convention, Hotel del Coronado, Coronado, Calif., June 11-13.

***American Society of Mechanical Engineers**
Semi-Annual Meeting, Sheraton-Gibson Hotel, Cincinnati, Ohio, June 15-19; Fall Meeting, Sheraton Hotel, Chicago, Ill., Sept. 8-11.

National Association of Corrosion Engineers
Short Course on Corrosion sponsored jointly by Cleveland Section of NACE and Case Institute of Technology at the Institute, Cleveland, Ohio, June 16-20.

***Illuminating Engineering Society**
Northeastern Regional Conference, Hotel Preston, Swampscott, Mass., June 19-20; National Technical Conference, Edgewater Beach Hotel, Chicago, Ill., Sept. 8-12.

American Institute of Electrical Engineers
Summer General Meeting, Hotel Nicollet, Minneapolis, Minn., June 23-27.

American Society for Testing Materials
Annual Meeting, 50th Anniversary, Hotels Statler-New Yorker, New York, June 23-27.

National Retail Credit Association
International Consumer Credit Conference, Statler Hotel, Washington, D. C., June 23-26.

Canadian Electrical Association
Annual Convention, Banff Springs Hotel, Banff, Alberta, June 30-July 2.

Maryland Utilities Association
Cavalier Hotel, Virginia Beach, Va., Sept. 5-6.

Rocky Mountain Electrical League
Fall Convention, Colorado Hotel, Glenwood Springs, Colo., Sept. 7-10.

American Standards Association
National Standardization Conference in conjunction with Centennial of Engineering, Museum of Science-Industry, Chicago, Ill., Sept. 8-10.

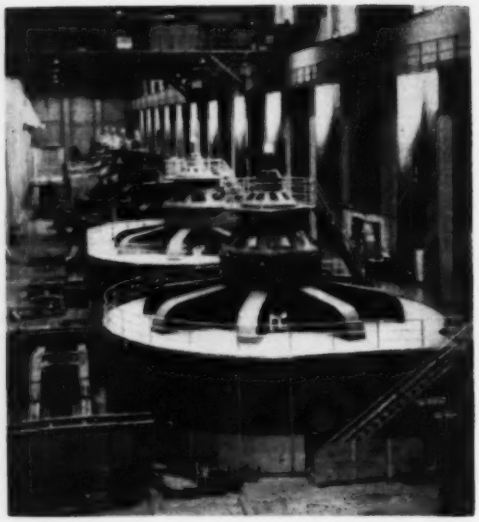
Public Information Program
Annual Workshop Conference, Edgewater Beach Hotel, Chicago, Ill., Sept. 18-19.

National Electronics Conference
8th Annual Conference, Sherman Hotel, Chicago, Ill., Sept. 29-30 and Oct. 1.

* Addition this week.

Pressing button to start . . .

Combining efforts to start generator are Governor Pyle, Senator MacFarland, Interior's Searles, Arizona Power Authority Boss Thomas



. . . Arizona unit at Hoover Dam

Unit A-4 (fourth in line) is sending out power for Arizona's use. Button-pushing ceremony initiated Reclamation jubilee celebration

Arizona Helps USBR Celebrate Jubilee

Agency carries its 50th anniversary festivities to state where its first project was constructed

The U. S. Bureau of Reclamation carried the observance of its golden jubilee to Arizona, scene of its first project, early this month.

In a three-fold celebration, the first of two 82,500-kw generators at Hoover Dam was put into service to supply Arizona with power from that project, Roosevelt Dam was rededicated, and the first water from the Colorado River was turned onto soil of Wellton-Mohawk Valley fields.

Sharing in Output . . . Undersecretary of the Interior Richard D. Searles, joined by Arizona officials, launched the week-long festivities by throwing the switch that started Hoover Dam power flowing into Arizona. The occasion marked the first time Arizona received power from the federal project, although entitled to 18% of the project's output under the 1928 Boulder Canyon Project Act. Arizona had delayed signing the Colorado River Compact until 1944 because of a disagreement over division of the Colorado's flow. World War II fur-

Original dedication, 1911 . . .

Theodore Roosevelt (arrow) was on hand in 1911 to dedicate dam bearing his name. Roosevelt signed the National Reclamation Act of 1902 which made construction of dam possible

. . . and rededication, 1952

Interested onlooker at rededication is stonemason who laid the last stone at dam

ther delayed the installation of Arizona's two generators.

Arizona's State Power Authority is the contract purchaser and distributor of the 165,000 kw which will come from the new $10.5 million installation at the project's power plant. The second 82,500-kw unit goes on the line in June. Arizona will repay cost of the generators over a 50-year period.

Rededication . . . Another highlight of the week-long celebration was the rededication of Roosevelt Dam at Phoenix. Many of the old-timers who worked on the dam, Indian laborers, some of the Italian stonecutters imported to chisel granite blocks for the dam, and a few of the pioneering officials observed the ceremony. The rededicatory address was delivered from the top of the dam, where Theodore Roosevelt dedicated it on March 18, 1911.

Third event took place when Reclamation Commissioner Michael W. Straus turned the first water from the Colorado River in the new 75,000-acre Wellton-Mohawk Reclamation Project near Yuma on Arizona's southern border.

The bureau's celebration marked the 50th anniversary of the passage of the Reclamation Act of 1902.

Turning the water on the land

Reclamation Commissioner Michael Straus opens irrigation ditch gate letting Colorado River water flow on Wellton-Mohawk Valley fields. With him is A. W. West, regional supervisor

. . . of Roosevelt Dam, Reclamation's first project

Roosevelt Dam was the first project completed by Reclamation. Built of hand-hewn rock, the dam rises 280 ft above the Salt River bed to impound a maximum of 1,381,580 acre ft of water. The stones were hauled by mule-drawn wagons; many of laborers were Apaches

NELPA's engineering and operation section meeting got off to a resounding start as Cecil Kirk, section chairman, brought the group to attention by banging a sledge hammer down on blacksmith's anvil. With him (l to r) are J. E. Corette, Montana Power, and C. T. Hurd, Depa

Success Depends on Service . . .

. . . rendered to customers, J. E. Corette tells engineering and operation section meeting of NELPA at Great Falls

The foundation of future success of the electrical utilities will be to supply the finest service at the lowest possible cost—and the primary responsibility for this success rests squarely on the engineer. Others in the industry can do little without this foundation—but with it utility industry's future is bright and encouraging.

In tracing before the engineering and operation section of the Northwest Electric Light and Power Association the recent favorable change in climate for the business-managed utilities, J. E. Corette, Montana Power Co vice president and general manager, thus stressed the importance of the engineer's contribution to the industry. He also told the group meeting at Great Falls, Mont., May 7-10, that a big factor in the change of climate is that the industry is now actively and aggressively fighting its battle and enlisting the support of the people.

Service Comes First . . . In the same vein, A. S. Cummins, president of the association and California Oregon Power Co, said it is of the utmost importance that the industry plan wisely, estimate accurately, and build soundly if it is to maintain its high standard of fine low-cost service. Adequate service comes first, he added, and the public will only be hurt by denial of fair rate increases where more revenue is needed to provide that adequate service.

With demand for metals still exceeding supply by 50%, Defense Electric Power Administration's administrative staff is of the opinion that it will be a substantial period of time before we are ready for decontrol. Clinton T. Hurd, Depa's Control Branch Major Projects chief, said the industry would be much worse off competing with other users on a free materials market, and asked its continued cooperation in making the best use of available metals.

Sam Pearson, Portland General Electric Co, listed the following four steps in conversion from copper to aluminum conductor: Transmission, where ACSR cuts the number of structures required; service wire, either single conductor or the new two insulated, one bare cabled conductor; rural primary lines, again for better span lengths; and finally (and least accepted to date) its use in heavy primary feeders. He said his own company's use of aluminum has proved out on an economic basis, pointing out that medium size aluminum conductor costs about 65% as much as copper. Extended discussion by manufacturers at the meeting reemphasized the need for more information and experience on fittings and connections, thus far the weak link in the use of aluminum.

Growth of Cooperatives Cited at REA Parley

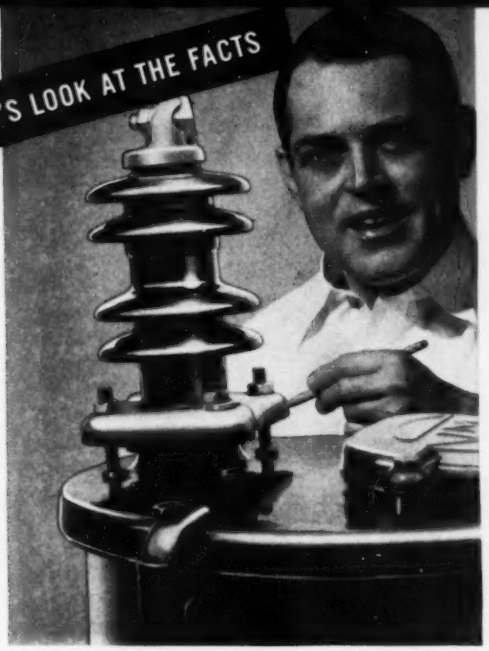
Cooperatives financed by Rural Electrification Administration receive 51.5% of their total energy requirements from power companies, generate 13.2% themselves, and buy 35.5% from federal agencies, J. B. McCurley, chief, Power Division of REA, told the third annual REA Conference on Operation and Maintenance of Power Plants in Milwaukee recently.

Remarkable growth has occurred, he said, since the REA generation program has been in effect. Meanwhile, he added, the power companies hesitated about adding capacity after the war because they thought there was going to be a depression. The result was a shortage of power, shortages of generation, transmission and sub transmission. The shortage resulted in the REA generation program, McCurly declared.

Of the REA loans approved last year, 30% were for generation. Of the total loans approved $2.5 billion, or 19%, have been for transmission and generation, McCurley said. Generation loans approved June 30, 1948 to Dec. 31, 1951, were sufficient to double the capacity, from 508,000 kw to 1,100,000 kw. Plants in operation increased from 190,000 kw to 570,000 kw.

Steam generation, McCurley pointed out, is coming more and more into the picture. In 1948, 26% of generation loans authorized were for steam plants. In 1951, 47.3% were for steam plants, 46.3% diesel, and 6.4% hydro.

LET'S LOOK AT THE FACTS



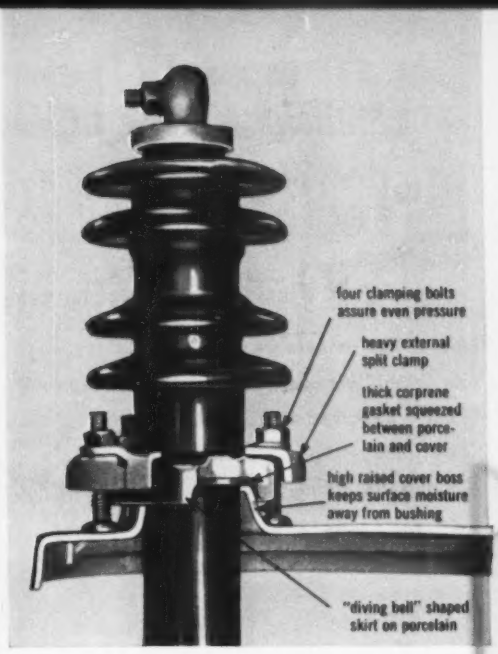

four clamping bolts assure even pressure
heavy external split clamp
thick corprene gasket squeezed between porcelain and cover
high raised cover boss keeps surface moisture away from bushing
"diving bell" shaped skirt on porcelain

FIGURE 1. Cover bushings on an L-M Round-Wound 15 kva 7200 volt transformer. Note the generous width of skirting for high creepage distance, the four-bolt cover clamp that assures even pressure on gasket and porcelain.

FIGURE 2. Close-up of triple-seal against moisture. 1. Deep-skirted porcelain gives "diving bell" effect. 2. Thick corprene gasket, squeezed between porcelain and steel boss. 3. Deep-drawn cover boss keeps moisture away.

Cover Bushings on L-M Round-Wound® Transformers Triple-Protected Against Moisture, Corona

"Diving Bell" design porcelain, thick corprene gasket, and high raised boss on cover provide triple barrier

By **ALVIN B. COYLE,**
Manager Transformer Sales
Line Material Company

In the design of cover bushings, L-M engineers have gone to great lengths to eliminate moisture entrance and corona, which would cause undesirable radio interference.

The porcelain itself is designed with exceptionally generous creepage distance and high wet-flashover characteristics. The best grades of electrical porcelain are used, with the surface fully glazed. At the bottom is an extra skirt or lip, which is curved downward to give a "diving bell" effect in keeping moisture away from the gasket.

The porcelain is mounted on an exceptionally high raised boss in the cover, which in itself leads moisture away from the bushing. Between the boss and the porcelain is a thick corprene gasket tightly squeezed by the four-bolt cover clamp. Corprene has the initial hermetic sealing property of synthetic rubber plus the elasticity and non-flowing characteristics of cork to maintain a permanent vapor-proof seal.

The result is a bushing that provides exceptional protection against moisture and breathing; it is corona-free and causes no radio interference.

Get Full Information

These cover bushings are standard equipment on all L-M Round-Wound transformers of 5000 volts and over. For more information on these and other features of these outstanding distribution transformers, ask the L-M Field Engineer; or write Mr. Coyle at the Transformer Division, Line Material Company, Zanesville, Ohio (a McGraw Electric Company Division).

87

LINE MATERIAL
Transformers
Complete Coordinated Equipment for Distribution Today

LM ORTO

NEW! EXCLUSIVE!
L-M's 7.5 KV "FAMILY"
of cutouts with interchangeable doors!

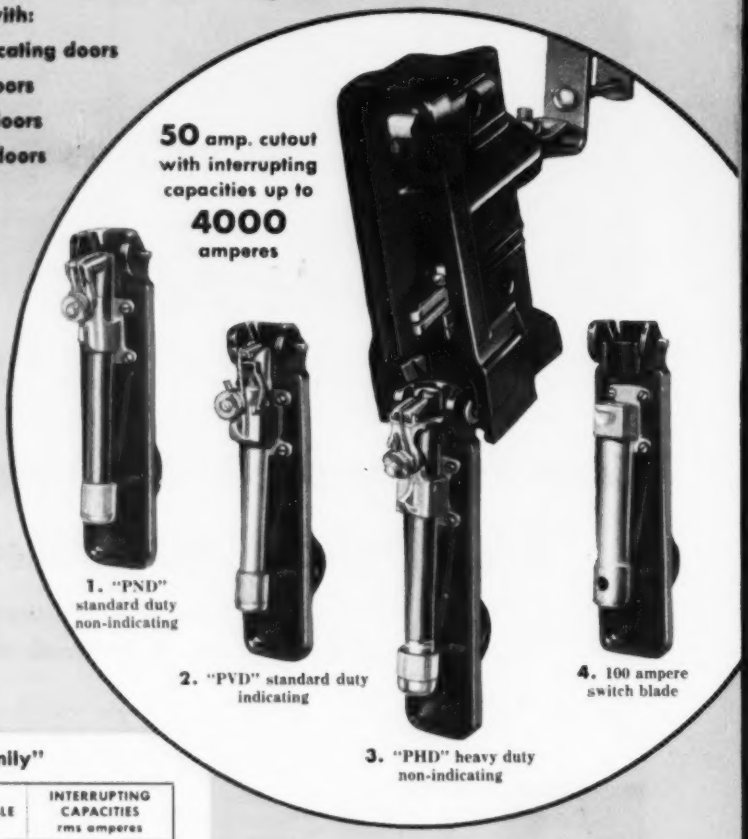
50 and 100 ampere cutouts, each with:
new "PND" standard duty non-indicating doors
"PVD"® standard duty indicating doors
"PHD" heavy duty non-indicating doors
100 and 200 ampere switch blade doors

Here's another L-M "first"! The new 7500-volt family of 50 and 100 ampere cutouts, each with four interchangeable doors to meet a wide variety of services. As operating requirements change, you simply change a door—in 6 seconds the job is done! Saves warehousing, saves installation time, saves in operation.

Safer, too. Doors are removed or hooked on, all with the switch stick. When door is open, all parts are dead.

GET THE WHOLE STORY

Ask the L-M Field Engineer for details on L-M's new "first families" —the 7500-volt family shown here, *and L-M's new 5000-volt family*, also! Or write Line Material Company, Milwaukee 1, Wis. (a McGraw Electric Company Division).


50 amp. cutout with interrupting capacities up to 4000 amperes
1. "PND" standard duty non-indicating
2. "PVD" standard duty indicating
3. "PHD" heavy duty non-indicating
4. 100 ampere switch blade

L-M's new 7.5 kv "Family"

RATING	INTERCHANGEABLE DOORS AVAILABLE	INTERRUPTING CAPACITIES rms amperes
50 AMPERES	1. "PND" standard duty non-indicating	1200 amperes
	2. "PVD" standard duty indicating	1200
	3. "PHD" heavy duty non-indicating	4000
	4. Switch Blade — 100 amperes continuous current rating	
100 AMPERES	5. "PND" standard duty non-indicating	3000 amperes
	6. "PVD" standard duty indicating	3000
	7. "PHD" heavy duty non-indicating	8000*
	8. Switch Blade — 200 amperes continuous current rating	

"PND", "PVD", AND "PHD" are L-M Trademarks

*Available soon

100 amp. cutout with interrupting capacities up to 8000 amperes

5. "PND" standard duty non-indicating
6. "PVD" standard duty indicating
7. "PHD" heavy duty non-indicating
8. 200 ampere switch blade

LINE MATERIAL
fuse cutouts

Complete Coordinated Equipment for Distribution Today

L-M's Expanding Anchors

now redesigned to give you

✓ FASTER INSTALLATION!
✓ GREATER HOLDING POWER!
✓ AT NO INCREASE IN PRICE!

L-M has redesigned its steel expanding anchors to give you easier installation, and greater holding power.

Expanded area is increased 10 to 15%—which means more holding power in any kind of soil.

Spreader arms are heavier and stronger. These improvements, together with a new hinge arrangement, completely eliminate binding. Tamping is much easier, installation is faster.

As the tamping block strikes the tamping collar, the strong spreader arms give the steel blades a sliding action that cuts into the surrounding soil quickly and easily.

These anchors are 8" in diameter when fully closed and are available in two-way, three-way, or four-way designs, for ½", ⅝", and ¾" anchor rods.

For complete information on these and other L-M Line Construction Materials, ask the L-M Field Engineer, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

LINE MATERIAL *Line Construction Materials*

Complete Coordinated Equipment for Distribution Today

John Sharp Heads Hotpoint

Firm's top executive is advanced from post of vice president. He also assumes duties of general manager

John C. Sharp has been elected president, general manager, and a director of Hotpoint, Inc, Chicago. He succeeds James J. Nance who has resigned to become president of Packard Motor Co.

The company also disclosed that Edward R. Taylor has resigned as vice president of marketing to take the newly created position of assistant to the president of Motorola, Inc, effective June 1.

Sharp, who has been with Hotpoint for 23 years, was vice president and chief engineer until this promotion. He also served on the company's management executive committee. Before joining Hotpoint, he worked for Standard Oil Co at Chicago.

Nance, who has had broad experience in the field of merchandising and management, has been president of Hotpoint since 1947.

J. C. SHARP

W. H. HITCHCOCK

C. M. McCREERY

Revere Names 2 Vice Presidents

Revere Copper & Brass, Inc, has elected Wallace H. Hitchcock vice president in charge of its Pacific Coast Division at Los Angeles and Chester M. McCreery vice president in charge of its Rome Manufacturing Co Division at Rome, N. Y. The company also named John C. Emison, Jr, assistant treasurer.

Hitchcock has been manager of the Pacific Coast Division since it was opened in April, 1949. He joined Revere in 1918. McCreery, who has been with the company since 1932, previously was manager of the Rome Manufacturing Co Division. Emison has been in the treasurer's office at Rome, N. Y., for the last several years.

R. E. Moody Elevated by Union Electric Co

Ralph E. Moody, executive vice president of Union Electric Co of Missouri, has been elected executive vice president and general manager. He will have charge of all phases of the company's business.

The utility also named Dudley Sanford, vice president in charge of operations, vice president and assistant general manager. He will continue in charge of operations of the company and will handle other phases of the business as assigned. G. P. Gamble, vice president, who has been in charge of power production, has been appointed as head of the transmission and distribution department.

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R. B. Willi has been appointed chief engineer of the Southwark Operation of the Eddystone Division of Baldwin-Lima-Hamilton Corp, Eddystone, Pa. Since 1945 Willi has been manager of hydraulic turbine engineering.

John D. Davis, deputy administrator of Defense Electric Power Administration, has been named assistant administrator of Bonneville Power Administration with headquarters at Portland, Ore. Davis, who has been with Depa since last October, will assume his new duties June 1. He succeeds D. Loring Marlett, who resigned in February after serving 13 years with BPA (EW, Feb. 25, p 63).

George J. Huber, Jr, manager of the Philo plant of Ohio Power Co, has been named manager of the company's new $45 million Muskingum River generating plant, now under construction north of Marietta. Edward L. Saidler succeeds Huber.

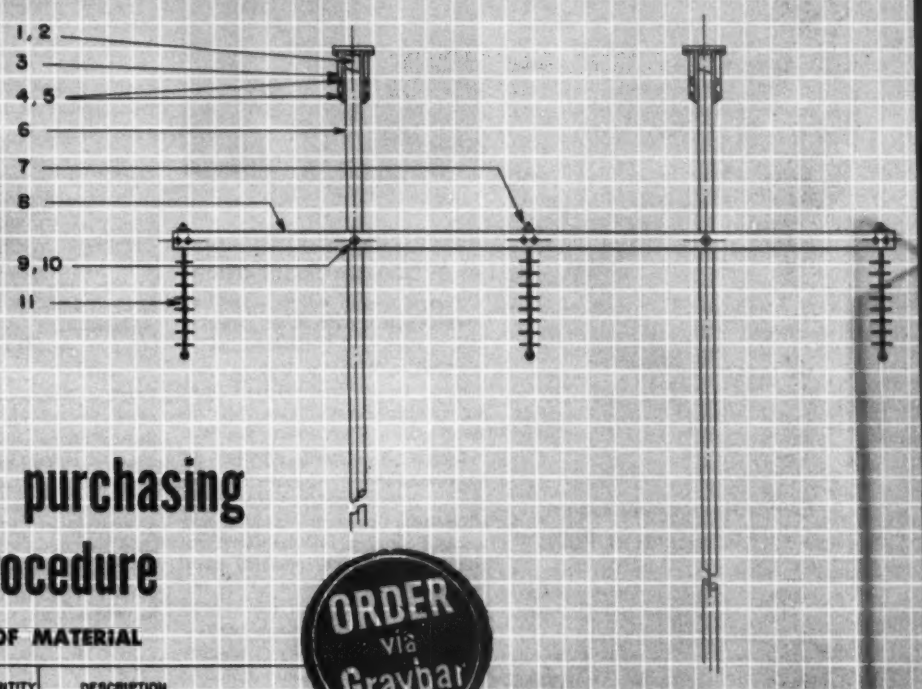
A. R. Royle has been made general manager and elected to the board of directors of Gai-Tronics Corp, Reading, Pa., manufacturer of specialized power plant communication systems. Royle joined the company in 1949 as sales manager.

James M. Wallace, formerly manager of the switchgear distribution apparatus department for Westinghouse Electric Corp at East Pittsburgh, Pa., has been transferred to Newark, N. J., and named manager of the company's

ACCEPTED STANDARDS

...in construction practice

TANGENT—H. FRAME STRUCTURE—METAL SPACERS WITH STEEL STATIC WIRE SUPPORT



...AND purchasing procedure

ORDER via Graybar

LIST OF MATERIAL

DRG REF.#	QUANTITY	DESCRIPTION
1	2	CLEVIS
2	2	SUSPENSION CLAMP FOR STATIC WIRE
3	2	STATIC WIRE SUPPORT
4	4	MACHINE BOLT 5/8"
5	4	MF LOCKNUT 5/8"
6	2	POLE
7	3	STEEL SPACER FITTING W/MOUNTING BOLTS
8	2	CROSSARM
9	2	STUD BOLT 7/8" W/2 WASHER NUTS
10	4	MF LOCKNUT 7/8"
11	As Req'd	SUSPENSION INSULATOR AND FITTINGS

With Graybar as your supplier, you take full advantage of a nation-wide distribution service. It's easy to order all of your transmission-line materials and supply requirements quickly and conveniently from a near-by Graybar office — it's the kind of standardization that saves time and paper work . . . assures you of quality products. *Graybar Electric Co., Inc. Executive offices: Graybar Building, N. Y. 17, N. Y.* 253-95

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Graybar Everything Electrical

IN OVER 100 PRINCIPAL CITIES

One of a series of advertisements high-lighting the economies of standardization

Meter Division. Wallace, who started with Westinghouse in 1935, succeeds **G. H. Grossnickle,** who has served as manager of the division since 1948. Grossnickle has been appointed manager of manufacturing.

Robert T. Borth has been named manager of General Electric Co's newly established plant community relations department. Borth, who will be located at the firm's New York office, will direct co-ordination of all GE plant community relations activities. He joined GE in 1931.

Eugene I. Pease, head of the engineering division of the Seattle District, Army Corps of Engineers, for the past five years, has retired after more than 41 years with the district.

Harold A. Smith, formerly associate director of public relations for American Gas & Electric Co, New York, and **Allen Rose** have established a public relations firm. The company, known as Smith, Rose & Co, is located at 270 Park Ave., New York 17.

General Electric Names 6 to Management Posts

General Electric Co has made six management appointments in the newly created appliance control department at Morrison, Ill.

They are Phillip Gomez, Jr, as manager of sales; Arnold Dunn, manufacturing engineer; James M. Clark, manager of finance; Alden L. Thomas, superintendent of the Morrison Plant; Thomas J. Kelly, design engineer; and James H. McDuffie, supervisor of personnel.

Gomez, who began with GE in 1941, has been in charge of appliance control sales for the control department. Dunn, who joined the company in 1947, has been serving in the Electronics Division at Syracuse. Clark, who has been with GE since 1936, has been the Morrison Plant's accountant for the past three years. Thomas has been with GE since 1949 as superintendent of the Morrison Plant. Kelley has been serving with GE as an assistant division engineer of appliance and aircraft controls. McDuffie entered the employ of GE in the Personnel Division of the switchgear organization at Philadelphia in 1947, becoming supervisor of personnel at the Morrison Plant in 1949.

THERON BROWN

Brown Elected President of Wisconsin Association

Theron Brown, vice president and general superintendent of Madison Gas & Electric Co, has been elected president of Wisconsin Utilities Association. He succeeds E. H. Cotton, vice president in charge of operation for Northern States Power Co, Wis.

George A. Donald, president of Lake Superior District Power Co, was elected vice president. Harold P. Chamberlin, assistant secretary and assistant treasurer of Wisconsin Electric Power Co, was appointed treasurer.

The new president of the association is a native of Wisconsin and is a graduate of the University of Wisconsin with a bachelor of science degree in electrical engineering, prior to which he served in the Navy during World War I.

Entering the utility field as a part-time student employee of Madison G&E while at the university, until his graduation in 1923, Brown has served in various capacities up to the executive post he now occupies.

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William H. Steinkamp has been made sales manager of the Industrial Division of Minneapolis-Honeywell Regulator Co. Steinkamp, who joined M-H in 1930, has been industrial field sales manager since 1943. He succeeds L. Morton Morley, who continues as vice president of the company's Brown Instruments Division.

Clarence W. Mayott, formerly manager of the Connecticut Valley Power Exchange and assistant to the president of Hartford Electric Light Co, has retired from the latter post. He is now a consultant on natural resources with headquarters at 266 Pearl St., Hartford, Conn.

Stanley J. Stephenson has been made merchandise manager of household refrigeration for Westinghouse Electric Corp's Appliance Division. Stephenson, who started with Westinghouse in 1941, has been serving as merchandise manager for electric ranges. **Robert P. Brook,** who joined the company in 1939, fills Stephenson's former post.

Donald E. Curtice, for the past six years superintendent of the American Lumber & Treating Co plant at Port Newark, N. J., has been appointed general superintendent of plants. Curtice, who joined American L&T in 1938, will make his headquarters at the company's general offices at Chicago.

Frank E. Reeves has joined the electrical engineering department of Ebasco International Corp, New York, as an electrical design engineer and has been appointed co-ordinating electrical engineer on the design of a new 80,000-kva hydroelectric power plant for Brazil. Previously Reeves had been associated in an engineering capacity with Boston Edison Co; Barnard & Burk, consulting engineers in Baton Rouge, La.; and Fay, Spofford, & Thorndike, Boston, Mass.

James J. Slattery has been elected a vice president and appointed general sales manager of General Electric Appliances, Inc. Slattery will make his headquarters at Bridgeport, Conn.

Dr Gordon S. Brown has been named head of the department of electrical engineering at Massachusetts Institute of Technology. Dr Brown, who will assume his new duties July 1, succeeds Dr Harold L. Hazen, whose appointment as dean on the Graduate School was announced recently. The new department head, who joined M.I.T. in 1931, is director of the institute's Servomechanisms Laboratory.

Paul Hallingby, Jr, has joined Middle South Utilities, Inc, New York, as an assistant to the president. Previously he was associated with First Boston Corp and E. F. Hutton & Co, both of New York.

Rome RoZone®

Superior Ozone-Resistant Insulation Deserves Your CONFIDENCE

What Ionization Testing of RoZone Means to You

Q: What is ionization?
A: Ionization is the electrical breakdown of air.

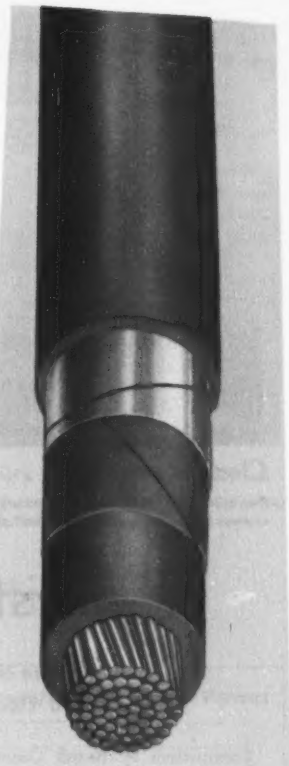
Q: Where can ionization occur in electrical wires and cables?
A: It can occur internally and externally unless preventative measures are taken.

Q: What are the bad effects of ionization?
A: a) Reduced dielectric strength.
b) Increased dielectric losses.
c) Possible reduced life.

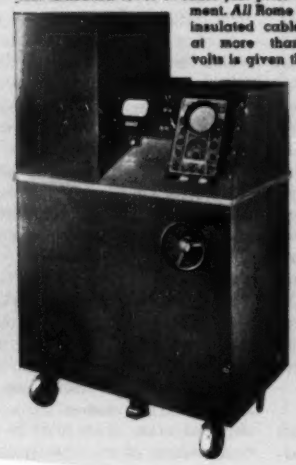
Q: How can ionization be determined?
A: By corona level measurements as described in AIEE Transactions, Volume 67, 1948. (A copy of this article will gladly be sent to you on request.)

Q: How can you prevent ionization?
A: By proper shielding methods and rigid manufacturing techniques and controls.

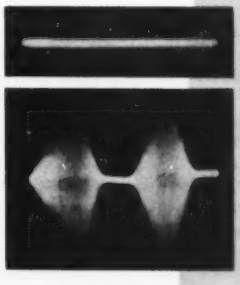
Every foot of RoZone insulated cable rated at 1000 volts and over is subjected to ionization testing as a standard manufacturing control. This predetermination of cable behavior under actual service conditions assures you of uniform performance, as well as maximum freedom from the effects of ionization.
Here is another reason why Rome RoZone deserves your confidence. For complete information send for the Rome Power and Control Cable Catalog. It's yours for the asking.



500,000 CM stranded single conductor RoZone insulated, shielded, RoPrene sheathed power cable . . . 15,000 volts, grounded neutral.



This specially designed instrument is used to test ionization level of cable just prior to shipment. *All* Rome RoZone insulated cable rated at more than 1000 volts is given this test.



The upper oscilloscope trace shows no ionization. Trace shown below indicates ionization point.

It Costs Less to Buy the Best

RoZone is approved and accepted by leading utilities, industrials and consulting engineers

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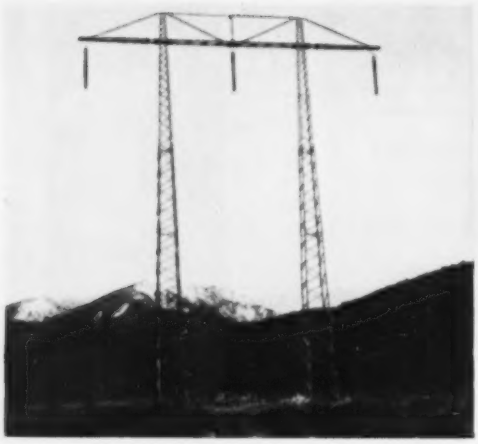


Clean tower design . . .

Two upper sections of 92½-ft masts are welded in shop, three bottom sections bolted in field. Mast and half of crossarm are field-assembled

Simple footings . . .

Each mast uses 8x12-in., 15-ft creosoted timbers laid on two steel plates. Parallel I-beams are bolted to plate by U-bolts

First 345-Kv Line in the West

More transmission capacity to meet future load is goal of British Columbia Electric Co. Economy is stressed in design and operation

Construction by British Columbia Electric Co of the first transmission line in the Western Hemisphere designed for 345 kv now is underway. Design features include bundle conductors, clean and simple tower construction, and a crossarm mounting designed to buckle in case both conductors in one of the outside phases break.

Carrying capacity of the line at 345 kv will be 500 Mw, or about 2½ times the capacity of present 230-kv lines for a cost increase of only 25-30%. It will be completed for initial operation at 230 kv about Oct. 1 to carry power from the company's new Wahleach plant 65 miles west through the Fraser Valley to Vancouver. The line will be extended to a final length of over 200 miles and put in service at 345 kv after a fourth unit is installed in three to four years at the company's Bridge River plant.

Bundle Conductors . . . The line will use a bundled-conductor construction with two standard 795,000-cir mils, ACSR conductors spaced 18 in. apart for each phase. Average span lengths of 1,000 ft are anticipated. Although only one conductor will be strung for initial operation at 230 kv, ultimate insulation of 21 insulators per string, with yokes and other hardware, is being installed during original construction. Insulators are rated at 25,000 lb.

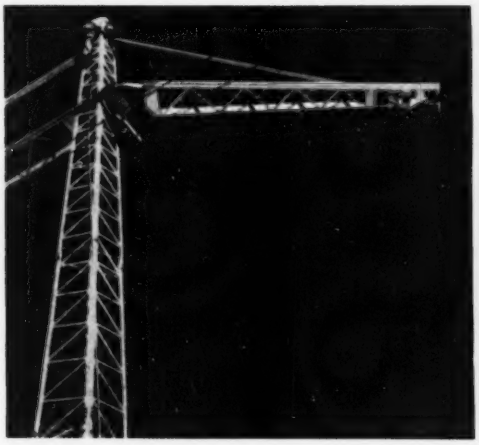
Selection of twin conductors at 345 kv was based on careful study of the characteristics and economies of expanded conductors and voltages up to 380 kv. Because potential hydro sites to supply the company's projected loads for the next 20-30 years are within 200 to 300 miles of Vancouver, these distances were taken as the upper and lower limits for lines to meet future requirements. Basic system assumed for the studies was a line transmitting power from a remote hydro station to a substation in the load area receiving power at a 230-kv bus. For transmission voltages above 230 kv, suitable autotransformers were assumed at the receiving end, with voltage stepped up directly from generator voltage at the generating end.

Equipment Delivery Decides . . . From the accompanying curves, it is apparent that for 200-mile transmission, 345-kv double-conductor line is the most economical, while for 300 miles, 380-kv double-conductor line is better by only a small margin. Because terminal equipment can be obtained for a 345-kv system in the relatively near future, the lower voltage was accepted as more suitable.

Studies of radio interference for twin conductors spaced at 18 in. and operating at 345 kv indicated they would be within the present radio influence voltage range of 500-2,000 microvolts (dry) for 230-kv single conductor. Specifications for hardware, including polished Stockbridge dampers, required that it not increase interference for the twin conductors above this equivalent level. Exhaustive tests indicate that this specification will be met.

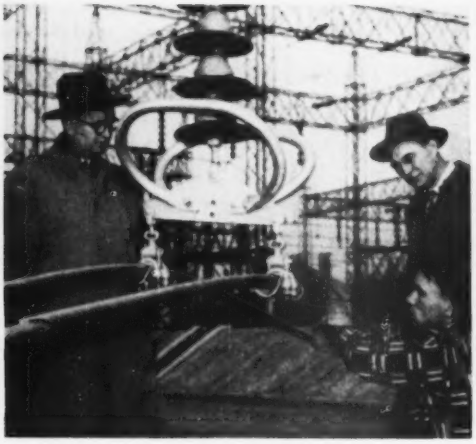
Tower Design . . . Outstanding innovation in design of the line is the two-mast transmission towers of welded and bolted construction. They are being assembled on the ground and erected in two halves by a truck-mounted crane with a 75-ft boom. Total weight of the 92½-ft tower is 15,000 lb.

Each mast is made of angles vary-



Special crossarms . . .

If design loading is exceeded when bundle conductor breaks, special section permits crossarm to bend without serious damage to tower



Double conductors are features of . . .

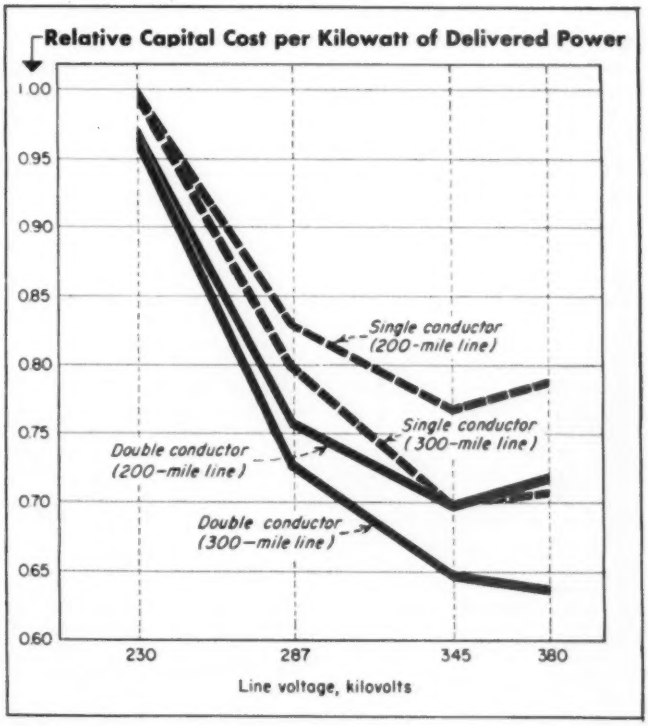
Two 795,000-cir mils, ACSR conductors are spaced 18 in. Grading rings will not be used during initial operations at 230 kv

Being Built by Canadian Utility

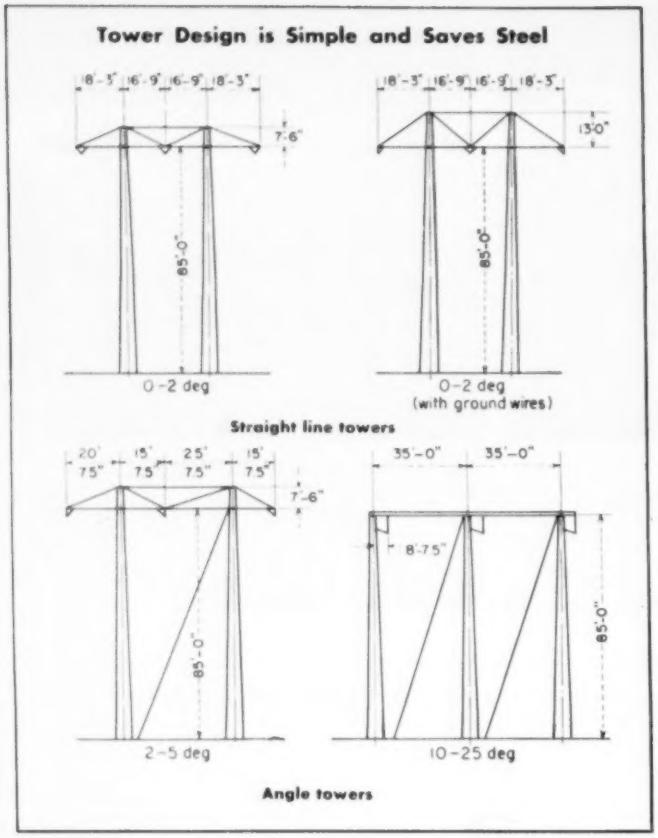
ing from 4x4x7/16 in. for the bottom to 3x3x3/8 in. for the top. Two top sections of the mast are shop-fabricated by welding and three bottom sections are bolted in the field. The 70-ft crossarm is assembled in the field from four shop-welded sections made up of 6 in. channels back to back. Assembly of two halves of a tower on the ground requires two days. The structure is then erected and bolted together. The time required for erecting and bolting is about half a day.

Tower Loadings . . . Towers are designed for standard heavy loading conditions with a tension of 15,230 lb per conductor on 1,000-ft spans. Safety factor of the mast is 1.5 overall and of the crossarm 1.5 transversely and vertically. Crossarm is designed to withstand 30% of the 31,460 lb loading longitudinally, on the assumption that if both conductors break the 11¾-ft insulator string will swing back far enough to reduce the load by 40%. This corresponds to a safety factor of 1.0 based on ultimate strength.

As an added precaution, the crossarm mounting adjacent to the outer point of support on the mast is designed to buckle if longitudinal loading with two broken conductors exceeds design values. This action will



CHOICE of 345 kv to meet BC Electric's transmitting distances of 200 to 300 miles was made because terminal equipment may be available sooner for this voltage than for 380 kv



INCONSPICUOUS STRUCTURE results from each basic design. Tower weight is only 15,000 lb, although safety factor is 1.5 for all design loadings except longitudinal arm loading

permit the end of the arm to swing sideways to further relieve the loading without doing any major damage to the tower. If both conductors of the center phase break, longitudinal load will be shared by the two masts with an ample margin of safety.

Tower Footings . . . Two parallel I-beams laid on creosoted timbers and held down by U-bolts to two steel plates beneath the timbers comprise the footing for each mast. The excavation is filled with dirt without any special protection against corrosion of tower legs. Because ground resistance is low throughout the Fraser Valley, no special grounding is required. Ground wires will be installed on top of each mast to a point one mile from each line terminal.

Spacing of the two 795,000-cir mils, ACSR conductors will be maintained at 18 in. by aluminum spacers installed no more than 400 ft apart. Ruling spans of 1,000 ft will therefore have two spacers. Preformed armor rod will be used at suspension points, and Stockbridge dampers will be installed over the armor rod parallel to the conductor. Dampers will be standard except for their finish, which will be a high polish to reduce corona and meet the specification on radio interference. Grading rings will be 1¼-in. tubular aluminum shaped roughly in 1 x 2 ft ellipses.

Parallel Lines . . . Right-of-way for three lines of the design described is being acquired through the length now under construction. Advantages of parallel-line operation with one or two intermediate switching points have been taken into consideration for future development of maximum line loading and for the condition of maximum power transmission with one section out of service. Use of 230 kv with capacitor compensation was discarded on the basis that such a method can only be makeshift in the long-term future.

Notwithstanding the possibility that usable energy for domestic, commercial, and industrial requirements may sometime in the future be derived from sources other than the presently established one, BC Electric believes it safe to assume that hydroelectric power, particularly in the Pacific Northwest, can remain an economic source of supply for decades to come. More efficient transmission at these higher voltages will certainly be a very important factor in extending that time.

REA Okays 3 'G&T' Loans Totalling $20 Million

Three generation and transmission loans totalling more than $20 million recently have been approved by Rural Electrification Administration.

Despite the fact that the certificate for construction is pending before a state court, REA approved an additional loan of nearly $15.75 million to East Kentucky Rural Electric Cooperative to enable it to build an 80,000-kw steam electric generating plant.

The Kentucky Public Service Commission issued a certificate for the plant and transmission system proposed by the co-op in December 1950, but three power companies appealed the commission decision. This appeal is still pending.

REA has previously approved loans to the co-op totalling $12,265,000. The latest loan would provide for a 40,000-kw unit to be added to the two 20,000-kw units already approved for the plant under construction at Ford, Ky. The REA loans will allow the co-op to construct nearly 1,400 miles of transmission line.

Other loans included $3.7 million to Medina Electric Cooperative, Hondo, Texas, to finance construction of a 13,400-kw diesel generating plant and 168 miles of 69-kv transmission line, and $1,303,000 to Metlakatla Indian Community, Annette Islands Reserve, Alaska, for construction of a 2,000-kw hydroelectric generating plant and about 13 miles of distribution line.

SMITHCRAFT LIGHTING booth is scene of confab by J. S. Ecclestone, Smithcraft; C. J. Allen; L. E. Taylor, Detroit Edison; C. W. Zersen

GENERAL ELECTRIC expert A. C. Barr explains a point to R. D. Allen, lighting analyst; E. D. Cooke, Illinois South Electric Supply

Lighting Equipment Makers Display Products, Discuss Sales Promotion

A distinct trend towards ceiling area lighting in various forms of louvers and panels was evident in the exhibits of the 4th International Lighting Exposition in Cleveland, May 6-9. Some 80 makers of lighting equipment displayed their wares to about 6,000 persons who sauntered up and down the aisles of the exhibit.

Conference Sessions . . . A series of conference sessions was held, paralleling the exposition. The first session opened with a talk, "Mobilizing with Planned Lighting," by Joseph S. Schuchert, Duquesne Light Co. Pointing to the vast postwar expansion of production facilities, Schuchert emphasized that industry must mobilize for sales as never before.

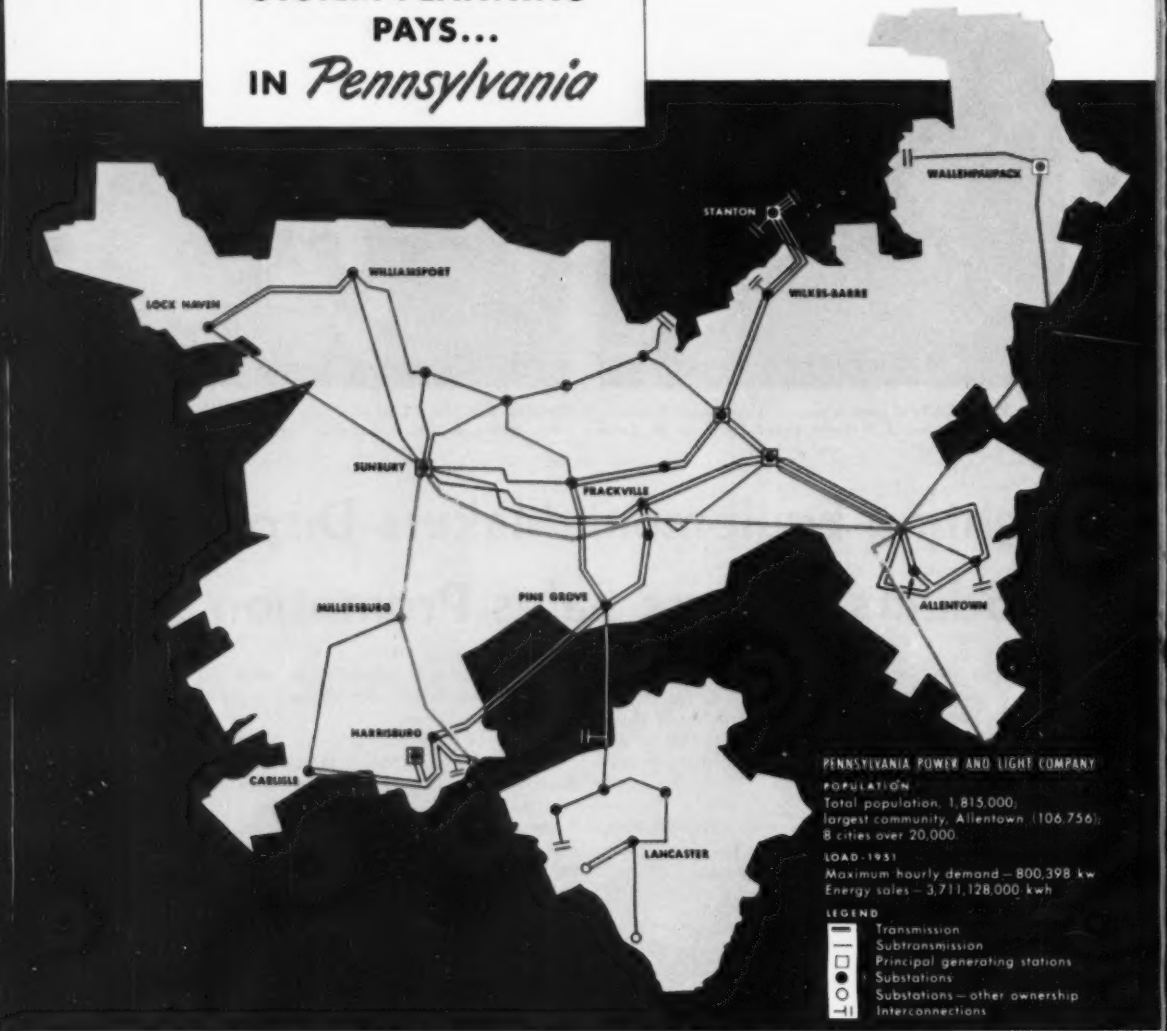
"Sales," he said, "equal profits which in turn mean improvements, advancement in science and art. Profits mean expansion, more employment, higher living standards, success, happiness."

Speaking on "Customer Education—Basis for Successful Planned Lighting Sales," S. L. Drumm, New Orleans Public Service, Inc, and chairman of the Better Light-Better Sight Bureau, said: (*Continued on page* 39)

WAKEFIELD BRASS Pres A. F. Wakefield (center) discusses features of acoustic baffle with R. E. Bull (left), J. W. Jones, Ohio Power

RUBY-PHILITE CORP representatives Jean Brewer and Arnold Hartstein (left) chat with Donald A. Marsden, Champion Lamp Works

SYSTEM PLANNING PAYS... IN *Pennsylvania*

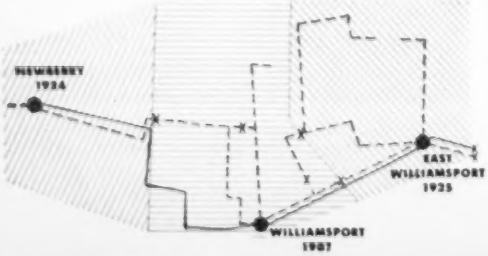


HOW THEY MET LOAD GROWTH AT WILLIAMSPORT...

In 1907, Williamsport had a load of 400 kw, with only one substation required. By 1925, the load had increased to 5000 kw, resulting in additions of substations in both the eastern and western parts of the area.

LEGEND
- 12-kv lines
- 4-kv lines
- Area of load responsibility
- Substation and year established
- Normal sectionalizing

Since 1925, the load has increased to 14,000 kw in 1951, and three more substations added. The lines feeding into Williamsport provide the reliability and capacity to expand the distribution system as the load grows.



Small power blocks ...long-range solution

Pennsylvania Power and Light Company can judge accurately the results of their system planning. Today this careful, long-range planning is reflected in their ability to supply more load . . . to grow easily and economically . . . to provide new high levels of service continuity. Small units of "load responsibility" are the cornerstone of this system, permitting them to take full advantage of modern *unitized* substations. The success of their long-range simplified system planning is measured by the practical yardstick of "economic workability".

How they built their system . . . Definite "load responsibility" such as 1500-2000 kva for 4 kv, and 3000-10,000 kva for 12 kv, is assigned to each block. As the load grows, additional blocks of load responsibility are supplied from a carefully planned 66-kv subtransmission system, covering their 9500 square miles of area served. This simplified network, in conjunction with an overlying high-voltage transmission system, permits picking up blocks of load or introducing power supply where required, and enables Pennsylvania Power and Light Company to utilize the inherent flexibility and reliability of modern unitized substations.

Meeting the growth is the payoff . . . While easily and economically meeting load-growth problems like that at Williamsport, the Pennsylvania Power and Light Company have carried on a tremendous expansion program, adding capacity throughout the system. With changes in electrical demands, it won't be necessary to change their "plan" . . . they'll simply accelerate it or slow it down, as the situation requires. Because of the economy and effectiveness of such planning, this progressive utility has every reason to face new peak loads confidently . . . they're ready to grow and grow!

Westinghouse modern unitized equipment, when installed as an integral part of such a long-range plan, can contribute to the ease, dependability, and economy of your operation. A completely staffed System Planning Service is ready to assist you. Call your nearby Westinghouse Office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

J-97160

YOU CAN BE SURE...IF IT'S Westinghouse

SYSTEM PLANNING SERVICE

There's a Westinghouse meter for every application!

Forecasts of unprecedented load growth in the coming years suggest many changes in metering practices. That's why a *complete* line of metering equipment holds an advantage for you. Specifically . . .

It's assurance that your future as well as your present needs can be readily fulfilled.

The meters illustrated here are just a few of the broad line of Westinghouse Meters offered to you. These and many more types are available to give you low-cost metering for every circuit application . . . three wire, four wire, wye or delta, or totalizing.

To meet your expanding needs, Westinghouse has continually pioneered new devices to make the desirable changes in metering methods a practical reality. And you have assurance of dependability because every Westinghouse Meter contains the quality and refinements that result from the engineering of a complete line. So whether your needs involve metering large loads or small, single or polyphase circuits, kw or kva, Westinghouse can meet your requirements.

For more information write for Booklet B-4665. Call your Westinghouse Office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-40412-A

YOU CAN BE SURE... IF IT'S Westinghouse METERS

Lighting Exposition

(*Continued from page 35*)

"Our customers will buy and use the amount and type of lighting they need only when they have been shown why they need it—when they understand fully the benefits it will bring to them, and realize that these benefits are worth the cost of the installation required."

Comfort in seeing is the final evaluation of a lighting installation, said Sylvester Guth, General Electric Co, in his paper on methods of assessing that desideratum. Many factors enter into seeing comfort—light intensity, absence of fatiguing glare, color, and shadow. How these factors may be combined to produce the desired result was comprehensively covered by the next speaker, Miss M. Callas, lighting consultant. Miss Callas illustrated with many examples how lighting must be handled as a component in architectural and decorative design through the use of such things as color, form, and texture to produce the desired result.

Light Quality . . . After many years of thinking about quantity of light, said George P. Wakefield, F. W. Wakefield Brass Co, we are now beginning to be concerned with light quality. Large ceiling luminaires and total (light) ceilings are expected to become more popular. And it can be expected that lower brightness lamps, such as the T-17, will gain greater acceptance. There will be a shift from present practice in luminaire design, which is based most entirely on fixture efficiency, to greater all around—35 to 45 deg—shielding of light sources.

Manufacturers of lighting equipment can look forward to continuation of the market for their products at the present or a slightly better level through 1954, according to Luther D. Shank, National Production Authority. Based on estimates of new construction for 1952, 1953, and 1954, the amount of lighting equipment thus required is figured at 331, 340 and 341 millions of dollars respectively. These estimates are believed to be conservative and considering projected increases in generating station capacity, may be exceeded by the actual figures of the coming years.

WHEELER REFLECTOR display attracts A. R. Hampsey, Duquesne Light; W. B. Elmer, Wheeler; and W. B. Shenk, Florida Power

WESTINGHOUSE representatives H. E. Plishker, Bea Mitchell, and P. H. Grunnagle welcome J. M. Steadman (right), Pennsylvania P&L

SYLVANIA employee Doris Underwood times Roger Ervin, Ervin Electric Co, to see how fast he can disassemble and assemble fixture

IES booth is meeting place of L. O. Banahan, R. W. Butts, Ohio Edison; Matthew Luckeish, consultant; J. S. Schuchert, Duquesne Light

DEAD-ENDING ALUMINUM

is an old story with us . . .

With the advent of the aluminum conductor and its growing acceptance and use during the past few years, we here at Pinco have kept abreast of this gradual change from copper to aluminum conductors by designing our products to meet both present and future industry requirements. Typical of these, are the three new Pinco Strain Clamps shown here which are designed to accommodate either ACSR or All Aluminum in distribution construction.

Yes, we are experienced hands when it comes to clamping aluminum and out of experience such as this, have come the many Pinco products which have been serving the electrical industry faithfully for *thirty-two years*. So if you have a problem, related to clamping aluminum conductor on your distribution and transmission lines, we invite you to PUT IT UP TO PINCO.

FEATURES

- Easy to blanket when working lines "hot".
- Excellent snubbing action, making them "easy" on the conductor.
- "Come-along" eye provided in all three clamps for easy installation of conductor.
- Quadrant type design allows continuous "running" of conductor—eliminates necessity of cutting the conductor at strain points to make "jumper" loops.
- Constructed of highest grade malleable iron, properly annealed and normalized, then hot-dip galvanized.
- Steel U-Bolts and Cotter Bolts, hot-dip galvanized. Spring Brass Cotter Keys.

All three clamps can be used for smaller conductors where a wide range is desired. Liners furnished if required.

PINCO INSULATORS

FIGHT ON THE LINE

The Porcelain Insulator Corporation
LIMA, NEW YORK

Sales Agents:
Joslyn Mfg. & Supply Co.
Offices in
Principal Cities

Appalachian Electric Hikes Pay

IBEW, utility reach agreement on contract which provides for a wage increase of 5% and other benefits

Appalachian Electric Power Co's 4,000 employees in Virginia and West Virginia get a 5% wage increase retroactive to April 1 and other benefits on the basis of a settlement reached in contract negotiations with the International Brotherhood of Electrical Workers, AFL.

M. O. Wilson, personnel director of the company, said that "We have been notified by J. R. Watkins, chairman of the System Council of IBEW locals that the local unions have voted to accept the offer made May 1."

Package Offering . . . The package offer includes the 5% wage boost, three weeks' vacation with pay after 15 years of service, the elimination of certain inequities, and several other contract changes. The pay increase and other changes are effective April 1.

In accordance with Appalachian's past practice, a similar wage hike, the change in vacation policy, and the other benefits would be given to all hourly paid and salaried employees of the company in West Virginia and Virginia.

Some 4,000 employees will be affected, he said, at an estimated cost to the company of approximately $750,000 annually.

Approval of the Wage and Salary Stabilization Board is necessary on all the changes, Wilson pointed out, except that 1½% of the wage increase can be paid without prior approval. He said the 1½% would be paid starting with the June 5 payroll.

The union contract, which covers some 1,000 of the employees and runs until March 31, 1953, will be signed in the near future.

Announcement of the agreement on the union contract came after negotiations were recessed on May 1 to give the union locals an opportunity to vote on the company's offer.

Negotiations began March 3, with only three sessions being held. Both company and union officials said that at no time during the discussions were they deadlocked.

Georgia Power Wins Safety Award

The National Safety Council's trophy for first award in the electrical division of Public Utilities Safety Contest is accepted by Harllee Branch, Jr, (right) president of Georgia Power Co. The presentation was made by Ned H. Dearborn, council president.

In 1951 more than 5,000 Georgia Power employees worked nearly 13 million man hours and had only 15 lost-time or disabling injuries. Four of the company's six geographical division went through the entire year without a single lost-time or disabling injury.

LABOR BRIEFS

Due to a change in Wage Stabilization Board regulations, Westinghouse Electric Corp will begin paying as soon as possible a cost-of-living wage increase (EW, May 12, p 38) to employees not represented by unions and to employees whose unions have accepted the company's offer, it has been announced.

A large percentage of the 2.3 million additional workers needed for defense production before the end of 1952 will require some training, W. F. Patterson, Director of the U. S. Department of Labor's Bureau of Apprenticeship, said at the Eighth Annual Eastern Seaboard Apprenticeship Conference held in Providence, R. I., recently.

Pensions paid to retired employees of public utility companies in New York State may be added to other operating expenses as a base for rates, according to a new policy announced recently by the New York State Public Service Commission. The new policy is to become effective next Jan. 1, retroactive, however, to last Jan. 1.

U. S. Department of Labor has just published in its Monthly Labor Review, May 1952, "Wage Chronology No. 22: Pacific Gas & Electric Co, 1943-51" on page 534. This study covers the changes in wages and related practices for operating, maintenance and construction workers (other than the General Construction Department) included in International Brotherhood of Electrical Workers contracts with Pacific G&E.

FINANCIAL

Consumers Power's Youngest 'Boss'

Nine-year-old Gerry Bosley, Saginaw, Mich, probably is the youngest share owner ever to attend a Consumers Power Co stockholder's meeting. He is the owner of 11 shares of common stock purchased with his own money.

Gerry discovered he couldn't buy any shares because of his age. But his mother went to Probate Court and was declared Gerry's legal guardian. This step is necessary for minors to own stock under their own name.

He is shown with his mother at a regional stockholders meeting in Saginaw, chatting with James P. Campbell, vice president, before the meeting got underway.

Most Municipal Utilities Not Regulated by States

A recent survey prepared by the Iowa Association of Municipal Utilities, showed that most states do not regulate municipal utilities. The study was made to help the association's argument against proposed legislation to establish a public utilities commission in Iowa and give it jurisdiction over municipal utilities.

The survey covered 41 states other than Iowa and Texas which do not have utility commissions. It showed that 28 of the states had no regulation of municipal utilities. The states of Alabama, Connecticut, Indiana, North Dakota, and West Virginia were not included in the survey.

Four states, Maine, Montana, Wisconsin, and Wyoming, have commissions with jurisdiction over municipal utilities, while four other states, Maryland, Massachusetts, New York, and New Jersey, have jurisdiction over municipal electric utilities but not over water systems. Five states, Colorado, Georgia, Nebraska, New Hampshire, and New Jersey, reported limited jurisdiction over municipal utility operations outside corporate limits.

Pacific G&E Rate Decision Is Expected in August

A decision on the proposed 18½% electric rate increase being asked by the Pacific Gas & Electric Co is not expected before August, California Public Utilities Commissioner Harold P. Huls has said. He has been hearing the case, along with the PUC's supervising utilities engineer, Manley Edwards.

The company was scheduled to submit survey reports at hearings to have been held May 21. Further hearings are set for June 18, when the PUC will present its analysis; July 2, when City of Stockton and other community protests will be heard; and July 23, for PG&E attorneys to present their rebuttal.

Wisconsin PSC Accepts Verdict of Market Place

In a decision recently handed down by the Wisconsin Public Service Commission authorizing Wisconsin Electric Power Co to raise rates $2,223,000 annually as compared with $3.5 million requested, the commission said on the matter of attracting capital stock by the company that currently "we accept the verdict of the market place." The order on this read:

"The ability of utilities to continue to attract equity capital at favorable rates during the current inflationary period is indicative of the fact that there still remains a substantial segment of the investing public to whom the attractiveness of stability of earnings and security of investment outweighs the attractiveness of an inflation hedge. The mere existence of inflation hedge possibilities negates the twin objectives of stability and security.

"Investors attempting to hedge against inflation are relying upon a concomitant high level of industrial activity to maintain a relatively constant purchasing power of the return on their investment during an inflationary period. Unlike the investor in a public utility, they face a very real risk that with deflation, earnings in terms of purchasing power may drop sharply or disappear and that even the investment itself may not be secure.

"Recent and current market history clearly shows the existence of sufficent diversity of investment interest to absorb at reasonable costs, the equity requirements of regulated utilities. When, as, and if, the investing public evidences a shift in investment preferences, the commission will of necessity give recognition to their demands. Currently, 'we accept the verdict of the market place.'"

REGULATION

Exeter & Hampton Electric Co's appeal for a $75,293 annual rate increase has been denied by the New Hampshire Public Service Commission. Majority of the board ruled that a $46,000 a year increase would be achieved and a 5.92% return attained by setting up a new rate schedule incorporating a fuel charge as part of the basic rates.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
1952									
May 15	**2.94**	**2.98**	**3.08**	**4.03**	**4.23**	**4.57**	**5.34**	**5.96**	**6.56**
May 8	2.94	2.98	3.10	4.03	4.24	4.57	5.36	5.99	6.55
1st 1952	2.95	2.99	3.13	4.11	4.29	4.66	5.35	6.03	6.47
4th 1951	3.02	3.07	3.21	4.32	4.50	4.91	5.42	6.18	6.84
3rd 1951	2.87	2.91	3.04	4.05	4.27	4.61	5.52	6.24	7.05
2nd 1951	3.02	3.11	3.23	4.11	4.37	4.68	5.73	6.38	7.37

Data: Reis & Chandler, Inc.

EARNINGS

Company	Period Months Ended		Net Income 1952	Net Income 1951	Earnings Per Common Share 1952	Earnings Per Common Share 1951
California Electric Power	12	Mar.	$1,810,552	$1,672,487	$0.66 (b)	$0.61 (b)
Carolina Power & Light	12	April	6,520,821	6,273,975	.....	.....
El Paso Electric	12	Mar.	1,461,223	1,397,532	1.82	1.74
General Public Utilities, domestic subsidiaries	12	Mar.	13,229,507	11,857,447	1.66	1.49
New York State Electric & Gas	12	April	7,030,465	5,796,680	2.49 (a)	2.18 (a)
Pacific Gas & Electric	12	Mar.	40,156,428	37,038,524	2.32 (a)	2.28 (a)
Quebec Power	3	Mar.	170,962	144,139	0.31	0.26
West Penn Electric, consolidated	12	Mar.	11,388,803	11,618,952	2.85 (a)	3.30 (a)
			1951	**1950**	**1951**	**1950**
Mountain States Power	12	Dec.	$1,397,026	$1,413,909	$1.16	$1.37

NOTES—The figures for the last company have been audited; (a) On shares outstanding at end of each period, and (b) On average number of shares outstanding during the period.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public
WEEK OF MAY 15–21			
Bonds			
Central Vermont Public Service—1st mtg 3¼% 1982	$1,500	101.997%	3.27%
Iowa Power & Light—1st mtg 3¼% 1982	10,000	101.93	3.15
Common Stock			
Central Vermont Public Service—108,900 sh (being offered to commonholders on 1-for-6 basis, record May 20 to expire June 3; New England Public Service, owner of 35.5% of common, waives its subscription rights)	$1,334	$12.25	6.53%
WEEK OF MAY 22–28			
Preferred Stock			
Dallas Power & Light—100,000 sh no par	$	.....	.....
Long Island Lighting—100,000 sh $100 par	10,000	.....	.....
Common Stock			
New England Electric System—920,573 sh (being offered to commonholders on 1-for-8 basis, record May 8 to expire May 26)	$11,622	$12.625	7.13%
Iowa Power & Light—226,835 sh (being offered to commonholders on 1-for-7 basis, record May 14 to expire May 28)	4,822	21.25	6.59
SCHEDULED FOR JUNE			
Bonds			**Bid Date**
Kansas Gas & Electric—1st mtg 1982	$12,000	.....	June 10
Northern States Power (Minn.)—1st mtg 1982	21,500	.....	June 10
American Gas & Electric—debentures 1977	20,000	.....	June 17
Boston Edison—1st mtg 1982	16,000	.....	June 17
Kentucky Utilities—1st mtg 1982	12,000	.....	June 17
Public Service Electric & Gas—debentures 1972	40,000	.....	June 17
Central Louisiana Electric—1st mtg 1982	4,000	.....	June 23
Gulf Power—1st mtg 1982	7,000	.....	June 24
Public Service of Indiana	25,000	.....	June 24
Preferred Stock			
Tampa Electric—50,000 sh $100 par	$5,000	.....	June 3
Public Service Co of Indiana—800,000 sh $25 par	20,000	.....	(b) June 17
Common Stock			
Wisconsin Electric Power—702,486 sh (being offered to commonholders on 1-for-5 basis (a), record May 6 to expire May 29)	$14,050	$20.00	6.50%
Tampa Electric—60,000 sh	.....	.....	June 3
Northern States Power (Minn.)—1,168,966 sh (to be offered to commonholders on 1-for-10 basis (a), record June 5 to expire June 23; price will be determined by competitive bidding)	.....	.....	June 4
Virginia Electric & Power—494,642 sh (to be offered to commonholders on 1-for-10 basis (a), record May 23 to expire June 9)	.....	.....	.....
Kansas Gas & Electric—200,000 sh	.....	.....	June 10
American Gas & Electric—170,000 sh	.....	.....	June 17
Southern Co—1,004,510 sh (to be offered to commonholders on 1-for-16 basis, record June 19 to expire July 10; company will set stock price; underwriters will be selected by competitive bidding)	.....	.....	June 18
Pacific Gas & Electric—2,271,300 sh (to be offered to stockholders on 1-for-5 basis, record June 10 to expire July 2)	.....	.....	.....

Notes—(a) Stockholders allowed oversubscription privilege, and (b) May be a negotiated deal.

FINANCIAL BRIEFS

Middle South Utilities, Inc, will pay July 1 to stockholders of record June 6 a common quarterly dividend of 32½¢ a share as compared with 30¢ a share in previous quarters.

Pubco Development Co, a subsidiary of Public Service Co of New Mexico, is planning to sell warrants at $2 each entitling the holder to purchase one share of its common stock. When exercised, each warrant will bring in another $1 per share.

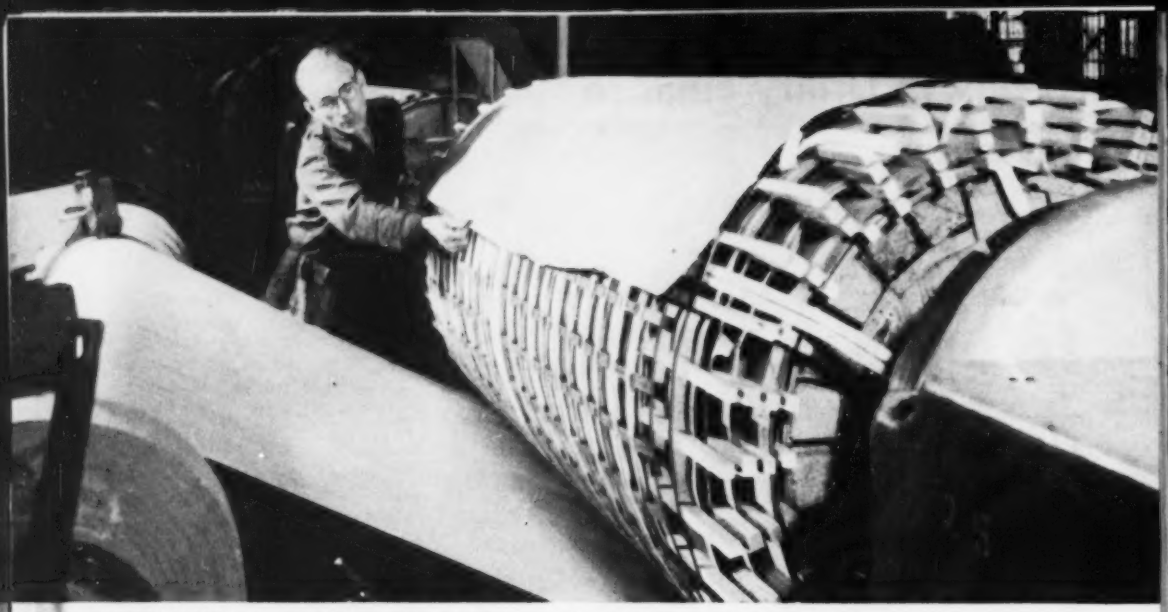
Stockholders of Central Maine Power Co approved (1) cumulative voting at election of directors, and (2) increases from one-third to a majority the number of votes representing outstanding shares of capital stock required for a quorum at stockholders' meetings . . . Oklahoma Gas & Electric Co earnings for 1952 are expected to approximate $1.90 per share against $1.69 in 1951 and $1.77 in 1950, Pres D. S. Kennedy told the annual stockholders meeting held recently.

Securities and Exchange Commission has announced that it has granted, at the request of Standard Gas & Electric Co, an extension to June 13, of the 15-day period within which the plan for simplification of the corporate structure of the Philadelphia Co system might be amended to conform to the commission's decision of April 7, 1952.

Federal Power Commission schedules oral argument for June 5 on exceptions to examiner's decision denying Niagara Mohawk Power Corp's proposal to amortize $1.5 million expenditure by ratable monthly charges to operating expense, covering a payment made in 1949 to the Aluminum Co of America incident to the closing down of Alcoa's Niagara Falls aluminum plant.

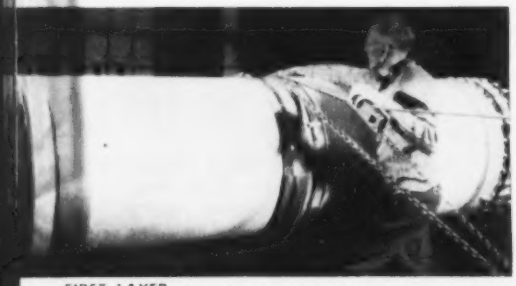
Duquesne Light Co stockholders will vote at a special meeting July 8 on a proposal to increase the authorized $50 par value preferred stock from 800,000 to 1 million shares.

Illinois Electric & Gas Co has received Illinois Commerce Commission approval to bill its customers by post card at a $2.5 million estimated annual saving.

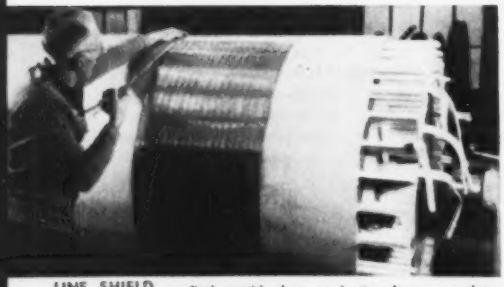


"CONCENTRIC LAYER" winding for 42,500-kva, 230-kv/132.8-kv GrY transformer. Workman is starting a layer of Kraft paper insulation. Other layers of insulation can be seen at the near end—separated by temporary wooden spacers. Later, these wooden spacers will be removed and the insulation will be flanged over the ends of the windings.

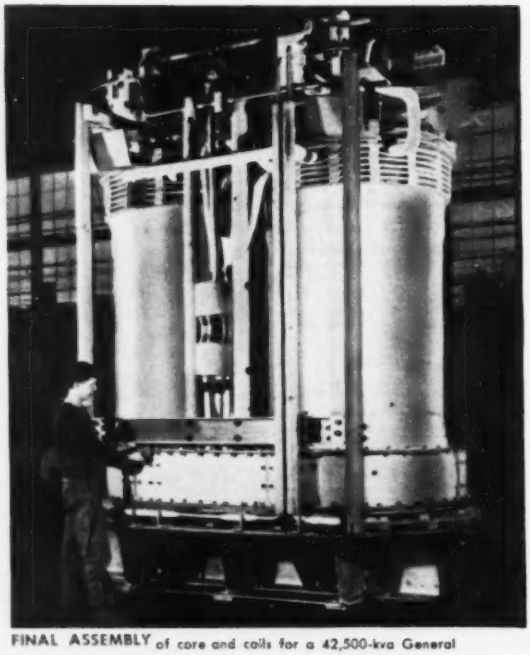
Here's "CONCENTRIC LAYER"...



FIRST LAYER of conductor is wound on laminated paper cylinder. Friction ring holds coil tight during winding. Each layer is clamped tightly while succeeding layers are wound.



LINE SHIELD applied outside last conducting layer completes shielding of coil. Final "cylinder" of insulation will cover this shield to complete the winding.



FINAL ASSEMBLY of core and coils for a 42,500-kva General Electric single-phase "concentric layer" power transformer is completed.

The power transformer winding that meets all the requirements for very high voltage

"Concentric Layer" windings provide important advantages on all G-E transformers 750-kv BIL and above

● **Uniform distribution of impulse voltages** and the elimination of harmful oscillations are characteristic of "concentric layer" construction. As a result, voltage stresses can be calculated accurately and insulation applied precisely as required.

● **Lower weights and dimensions.** Voltage stresses between the low- and high-voltage windings are reduced to a fraction of those occurring with other types of construction. Space factor is improved, and the reduction in weights and dimensions permits a larger kva unit to be built in a one-piece tank.

● **Effective inter-layer cooling.** Vertical ducts between layers permit unrestricted oil flow past each conductor.

● **Greater mechanical strength.** Major magnetic stresses in the "concentric layer" winding appear as *tensile* forces. These are inherently easier to withstand than the *bending* forces which occur in non-concentric designs. A full size "concentric layer" transformer successfully passed short-circuit tests at *rated* voltage, demonstrating the great mechanical strength of these windings.

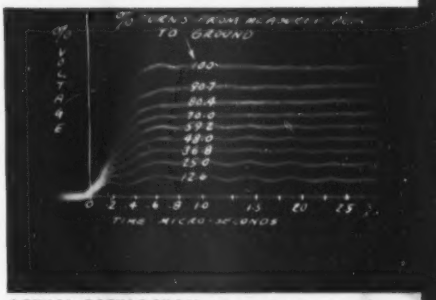
G-E "concentric layer" transformers now being built at a rate of 2,500,000 kva per year!

Calculations and tests show that from every angle the "concentric layer" winding is superior. Since 1940, all new G-E transformer designs, 750 kv BIL and above, have included this winding. Today, with the rising trend to higher system voltages, shipments of G-E "concentric layer" transformers are exceeding 2,500,000 kva per year!

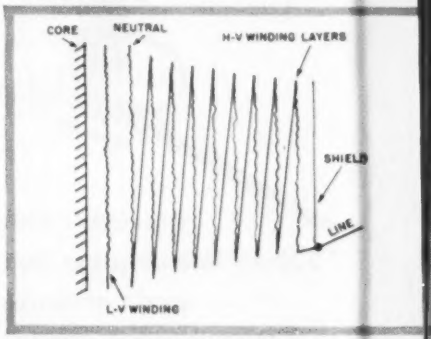
If you are contemplating voltages of 161-kv and above, you may wish to review the data on these windings. Ask for GER-129. Address inquiries to your nearest G-E Apparatus Sales Office, or write directly to Section 401-28, General Electric Company, Schenectady 5, N. Y.

"Concentric layer" windings consist of a number of cylindrical layers arranged concentrically, as shown on these pages. The innermost layer, adjacent to the low-voltage winding, is connected to the neutral. Then, successive layers are connected in series progressively, with the outer layer being connected to the line.

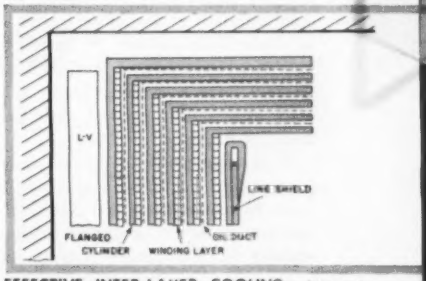
Basic insulation is provided by cylinders of insulating material. These cylinders are flanged over the ends of the winding to eliminate creepage paths in the direction of high electrical stress. The *entire* winding is protected from transient voltage stresses by electrostatic shielding.



ACTUAL OSCILLOGRAM showing voltage to ground at equally spaced points in the winding when 0.6 x 190 microsecond impulse wave was applied to line end. Absence of large oscillation is indicative of uniform impulse distribution.

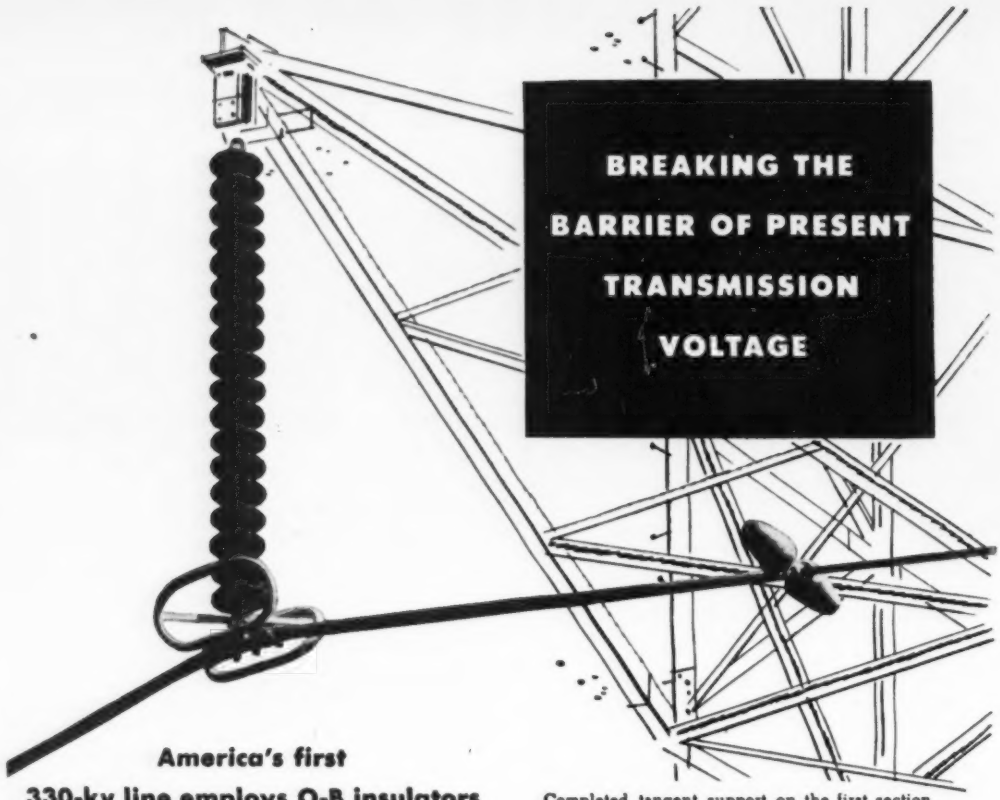


WINDING CONNECTION DIAGRAM shows that voltages between layers and between high- and low-voltage windings are only the voltage of one layer since successive layers are connected in series progressively.



EFFECTIVE INTER-LAYER COOLING. Schematic diagram of "concentric layer" winding showing six layers insulated by flanged cylinders. Dotted lines show path of oil past each turn of the winding.

GENERAL ELECTRIC



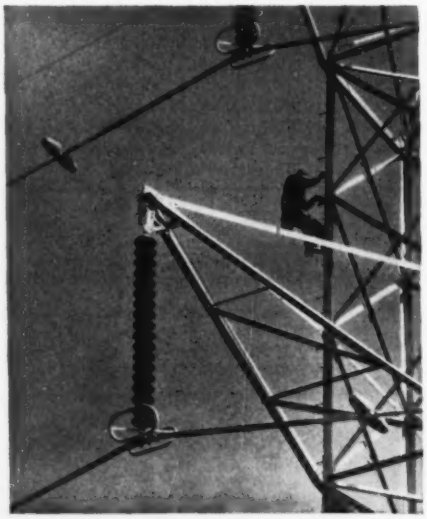
BREAKING THE BARRIER OF PRESENT TRANSMISSION VOLTAGE

America's first 330-kv line employs O-B insulators and hardware

Breaking through the barrier of present high voltage transmission practice, American Gas and Electric Corp. has completed the initial 61-mile section of America's first 330-kv interconnecting trunk line, ultimately to span from the coal deposits of the Appalachian area to the Lower Great Lake district. To be built by the operating subsidiaries of A. G. & E., this important project links a series of large generating plants with heavy load centers through the industrial heart of America.

O-B takes pride in supplying large quantities of standard 15,000-pound and 25,000-pound units for suspension and deadend strings, Cooline non-magnetic conductor clamps, and corona shields on this history-making development.

Completed tangent support on the first section of A. G. & E.'s new 330-kv transmission line. It is of interest that the insulator string shown supporting the 1.6-inch ACSR conductor is of standard O-B design; and the suspension clamp is the conventional O-B Cooline pattern. Adherence to service-tested components and practices is highly noteworthy in a new project of this size and voltage.



Ohio Brass

MANSFIELD • OHIO

4228-M

NARRATOR in General Electric's motion picture on Progressive Mechanization (shown above) represents professional methods engineer. He points out four basic stages on mechanization and attempts to encourage management to raise its operations at least one notch in scale

GE Plugs Mechanization

General Electric Co has announced a new visual program designed to boost American productivity by offering a modern, step-by-step approach to the problems of industrial mechanization.

Called Progressive Mechanization, the program is an attempt to present a concise, workable consolidation of the principles of production technique and methodology. It is the 24th in GE's More Power to America series. The program reflects GE's experience in promoting production improvements at its plants.

Three Parts . . . The program is designed for use by large industrial firms, machinery manufacturers, electric utilities, consulting engineers, contractors, trade associations, and other groups. It consists of three basic parts: a 16-mm sound-color motion picture, a manual, and a survey form and check list.

The film, "Motors in Industry," explains the concept of progressive mechanization in four step-up stages. It goes from hand operation to simple machine, from simple machine to improved machine, from improved machine to automatic control, and from automatic control to continuous process. Movie lasts 27 minutes.

Manual Explains Effects . . . To follow up the movie with more specific information and suggestions, the 16-page Progressive Mechanization manual (GEA-5789) is designed to help management initiate its own program to improve its industrial processes. It tells what Progressive Mechanization is, explains its effect on productivity, product quality, and costs, and shows how it can be and is being accomplished in a number of industrial applications. The bulletin also includes a sample exploratory survey that management can apply to its operations, and lists services that can assist in follow through.

The survey form—check list is a single sheet extracted from the manual. On one side it has a form for enumerating the machines and processes recommended for investigation, and on the other side is a check list of suggested areas of improvement.

The Progressive Mechanization program is packaged in a kit containing one print of the film, five copies of the manual, and 25 copies of the survey form.

The entire presentation may be purchased outright from GE, or is available for single showings through any of the company's nationwide chain of apparatus offices.

Sylvania's 1st Quarter Sales and Income Drop

Sylvania Electric Products, Inc, has reported that net sales for the three months ended March 31 totaled $55,967,461. This figure was the second highest first quarter sales in Sylvania's history, exceeded only by the $60,631,085 total of the first quarter in 1951.

Net income for the quarter after provision for federal taxes on income was $1,953,771. After deducting dividends for preferred this was equal to 87¢ per share on 1,867,625 shares of common stock outstanding. The corresponding figures for the first quarter of 1951 were $3,515,155 and $2.34 on 1,456,550 shares then outstanding.

The 44% drop in net earnings was due partly to heavier costs, especially payroll, and partly to a different product mix. But it was "very largely because last year's sellers' market with firm prices had given way to a buyers' market with soft prices in several lines," according to Pres Don G. Mitchell.

Mitchell said that in the report for the first quarter last year attention was drawn to the probability of a lower demand. The seasonal influence will be felt again this year, he added. But the orders received picture indicates a considerably smaller drop in the second and third quarter over last year. He said, "Sales for 1952, therefore, could show another sizable increase."

McGraw Gets Assets of Transformer Firm

The directors of Pennsylvania Transformer Co, Canonsburg, Pa., have voted to dissolve the company and in accordance with the plan, all assets and liabilities are being assumed by McGraw Electric Co, Chicago, which previously had acquired all the outstanding capital stock of Pennsylvania Transformer.

Operations of the firm will continue at Canonsburg under the name of Pennsylvania Transformer Co, a division of McGraw Electric Co, with the same personnel. For the present, no changes are contemplated in company policies and methods of conducting the business.

MANUFACTURING BRIEFS

Babcock & Wilcox Co has opened offices in the recently completed 32-story Chrysler Bldg East at 161 E. 42nd St., New York. Sales offices of B&W's Tubular Products Division will not be affected by the move and will remain in the present location at 22 E. 40th St. In its new headquarters B&W will occupy the second through the sixth floors, totalling approximately 120,000 sq ft of space. Of the company's 14,000 employees, 825 are in the New York office.

John A. Roebling's Sons Co, Trenton, N. J., has moved its Los Angeles district office and warehouse to 5340 East Harbor St., Los Angeles, Calif. The firm's new, modern building occupies 44,500 ft of floor space.

American Brass Co, a fabricating subsidiary of Anaconda Copper Mining Co, has opened its new $1.5 million Chicago copper and brass warehouse. The new warehouse, which contains 62,500 sq ft of storage space, is equipped with power tools for cutting-to-length, slitting, shearing and sawing.

SALES ASSIGNMENTS

COMPANY STAFFS

Owens-Corning Fiberglas Corp's Pacific Coast Division has appointed Paul L. Layton Fiberglas textile sales representative. Layton, who started with the firm in 1941, comes from the New York office, where he was a technical assistant. The new representative, whose headquarters will be at the Los Angeles branch office, will cover California, Nevada, New Mexico, Utah and lower Idaho.

Mathias Klein & Sons, Chicago, has made the following field assignments: Arnold L. Moore, with headquarters at Atlanta, Ga., will handle the South and Southwest areas; Charles F. Castino, headquarters in Chicago, Chicago area; W. J. McAmis, headquarters in Chicago, North Central States; and George W. Kidd, headquarters in St. Louis, Central States.

Graybar Electric Co, Inc, New York, has appointed F. M. Sholders manager of its Omaha Branch. Sholders, who joined Graybar in 1936, has been manager of the lamp and lighting department at Kansas City since 1945. He succeeds **D. L. Harper,** newly appointed Jacksonville (Fla.) district manager.

Allis-Chalmers Manufacturing Co, Milwaukee, has appointed John L. Wiedey its sales representative in the Indianapolis district office. Wiedey joined A-C in 1946 and has been serving as an application engineer in the switchgear section for the past two years.

NEW ELECTRICAL CONSTRUCTION

A weekly selection of U. S. electrical construction projects announced by private and government utility systems involving more than $70,000. Also listed are major industrial and construction jobs where electrical work is indicated or implied

UTILITIES

Proposed Construction

Calif., Morro—U. S. Eng., 751 S. Figueroa St., Los Angeles, construct control tower, Eng 04-353-52-58, $100,-000; electrical distr. system, ENG 04-353-52-59, $400,000; both at Edward Air Force Base.

Ia., Bellevue—Town, Harold W. Yeager, clk., light and power plant addns. Plans deposit $25, Federal Eng. Co., Putnam Bldg., Des Moines, engr.

Mich., Bay City—City, Municipal Electric Light Dpt., brick, steel, concrete municipal lighting plant imprvs. $500,000, Ayres, Lewis, Norris & May, 500 Wolverine Bldg., Ann Arbor, consult. engrs.

Missouri—Citizens Electric Corp., 216 Merchants St., Ste. Genevieve, 2 sub-stations 69 plus 33 kv 10,000 kva each, addn. to existing 69 kv sub-station. Extended date. Drazen & Assoc., 8135 Forsyth Blvd., St. Louis, Zone 24, engrs.

Mo., Chillicothe—Farmers' Electric Co-operative, J. S. Hopper, pres., Chillicothe. REA headquarters and service bldg., U.S. 36 near city limits. Stanley Eng. Co., Hershey Bldg., Muscatine, Ia., engr.

N. C., Camp Lejeune—P. Wks. Office, P.O. Box 365, Naval Base, Charleston, S. C., addnl electrical generating facilities U. S. Marine Barracks, W. C. Olsen & Assoc., P.O. Box 271, Raleigh, consult. engrs.

Oregon—Benton-Lincoln Electric Co-operative, Carvallis, 71-mi. rural distr. lines, headquarters facilities, sys. imprvs., completion of previously approved const., Lincoln Co. $1,550,000.

S. C., Parris Island—Dpt. Navy Officer in Charge of Construction, Box 365, Naval Base, Charleston, steam turbine generator unit at U. S. Marine Corps Recruit Depot, NOY 72928. Plans deposit $10.

Tex., Beaumont—Gulf States Utilities Co., 362 Liberty St., power plant, facilities, $8,500,000.

Tex., Belton—Farmers Telephone Co., Belton, plans by J. Mack Jones, 13 and 14 Mays Bldg., Corsicana, 300 mi. rural telephone pole lines, $250,000.

Tex., Colorado City—Texas Electric Service Co., Grand Prairie, electric power plant, some lines, near here, $7,500,000.

Tex., Elkton—Texas Power & Light Co., Interurban Bldg., Dallas, power plant, facilities, $3,912,000.

Tex., San Antonio—City Public Service Bd., 301 N. Main St., bulk sub-station to transmit power from generating sources to consumer outlets, $500,000; bulk sub-station to transmit power from generator sources to consumer outlets on north side, Bandera Rd.-McCullough Ave. sectors, $500,000.

Washington—Bureau Reclamation, Dpt. Interior, Coulee Dam, pump installations Units P5 and P6, Grand Coulee Pumping Plant and misc. metalwork and electrical installations, Grand Coulee Dam, Pumping Plant, and Power Plant, Columbia Basin Proj., at Coulee Dam, Spec. DC 3715. L. N. McClellan, ch. engr.

Washington—Grays Harbor Public Utility Dist., Montesano, 14,000 ft. 55-kv transmission line from Elma to East Elma and three 69-kv oil circuit breakers for Elma sub-station to transform and relay Bonneville power supply between Montesano, Elmar and McCleary, Grays Harbor Co. $104,811.

Wis., Menomonie—Dunn County Electric Co-operative, Menomonie, 1 story, L-shaped, 84x136 ft., concrete, brick garage-warehouse-office, $107,-000, Boyum, Schubert & Sorensen, Hoeschler Bldg., La Crosse, archts.

Alaska—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., power transformers, power circuit breakers and air switches for Anchorage sub-station, Eklutna Proj., Inv. No. DS-3653. Bids Mar. 20, rejected.

Alaska, Ketchikan—Bureau Reclamation, Dpt. Interior, Bldg., 53, Denver Federal Center, Denver, Colo., hydro-electric dam at Swan Lake, near here, $13,562,000.

Phillipine Islands—National Power Corp. of Manila, Natnidad Bldg., Manila, Job. No. 4, power plant; Job. 3, turbines and generator; Job. 2, dam and spillway; 2 diversion tunnels, 600 meters long, 7 meters in diam. at Ambuclao. Total $50,000,000. Harza Eng. Co., 400 W. Madison St., Chicago 6, Ill., engr.

Low Bidders & Contracts Awarded

California—Brown Boveri Corp., 19 Rector St., New York, N. Y. CA, $155,-260, Schedule 2, three 230,000 volt circuit breakers with spare parts for Elverta sub-station, Central Valley Pro., Spec. DS 3655, Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Awarded Apr. 28.

Conn., Norwalk—Thomas B. Stewart, Devils Garden Rd., South Norwalk, Conn., CA, $260,000, 15,600 sq ft. electric circuit controller plant. Electric Regulator Corp., 50 Day St., South Norwalk, Conn.

Del., Wilmington—John J. McDonnell, McClatchy Bldg., Upper Darby, Pa., LB, $337,203, electrical system and walkways, Spec. 31770, Dpt. Navy, Phila. Naval Base, Phila., Pa.

Kentucky—Leo T. Barber, 110 First St., N. E., Moultrie, Ga. CA $251,667, 23.23 mi. of 60 kv rural distr. lines, transmission line, 2 sub-stations, switching station, Fleming Co. Fleming-Mason Rural Electric Co-operative Corp., Flemingsburg, Ky. Patterson & Dewar, Rutland Bldg., Decatur, Ga., engrs.

INDUSTRIAL, COMMERCIAL & PUBLIC BUILDINGS

Proposed Construction

Ill., Plainfield — Hazel-Atlas Glass Co., 15 and Jacob Sts., Wheeling, W. Va., glass factory on 75 acre site $4,000,000.

Ind., Greencastle — International Business Machines Corp., 500 Madison Ave., New York 22, N. Y., factory on 58-acre site east of city limits. $3,-500,000.

Neb., LaPlatte—Allied Chemical & Dye Corp., 61 Broadway, New York, N. Y., fertilizer plant, $25,000,000.

O., Akron — Bd. Trustees Peoples Hospital, 256 W. Cedar St., 200-bed hospital addn. $4,816,900.

Okla., Tulsa—Sinclair Oil Co., Sinclair Bldg., office $2,000,000. P. C. Spencer, c/o owner, engr.

Tex., Beaumont—Magnolia Petroleum Co., South Beaumont, octane gasoline productive refinery expansion, $7,820,800.

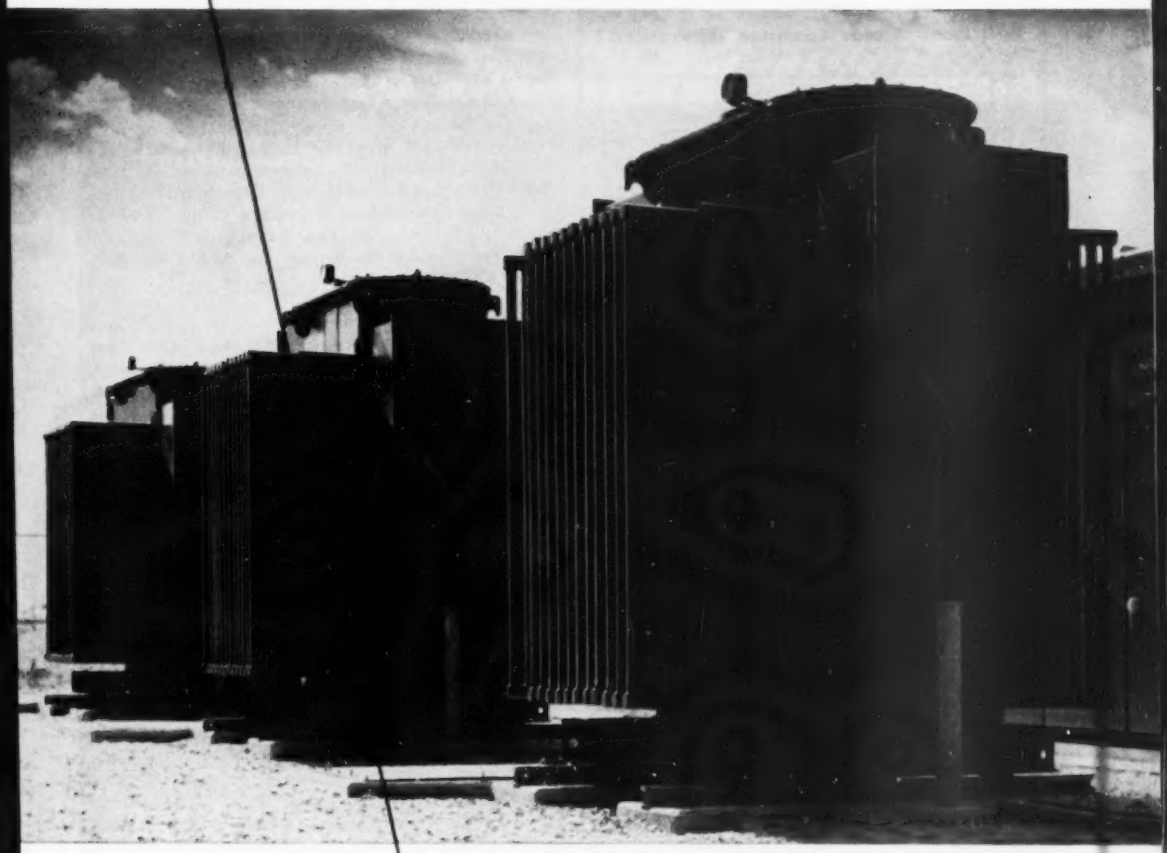
Tex., Freeport—Dow Chemical Co., Freeport, expansion of plants. $5,000,-000.

Low Bidders & Contracts Awarded

Pa., Phila.—United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa., CA. Approx. $6,000,000, 4 story brick, structural steel steam and gas turbine development laboratory at the South Philadelphia Works, Westinghouse Electric Corp., 401 Liberty Ave., Pittsburgh 30, Pa.

S. C., Aiken—J. Howard Mitchell, 23 Patton Dr., Pittsburgh, Pa., CA. Approx. $3,000,000, shopping center. Gordy Homes, Inc., c/o contractor.

MORE POWER FOR KANSAS



These three Kuhlman Power Transformers on the lines of a large Kansas utility are part of a contingent of 25 Kuhlmans which help supply electric light and power for thousands of customers in the Prairie State. Each of the 3000 KVA, three phase transformers have underground connections. They were installed to increase the capacity of a sub-station generating plant.

Utilities and industries throughout the United States and abroad specify Kuhlman Transformers chiefly because of Kuhlman's 58 year reputation for expert engineering and rugged construction. That's good assurance, because when you're in the market for transformers, you naturally want a product that's going to give you satisfaction and last a long time.

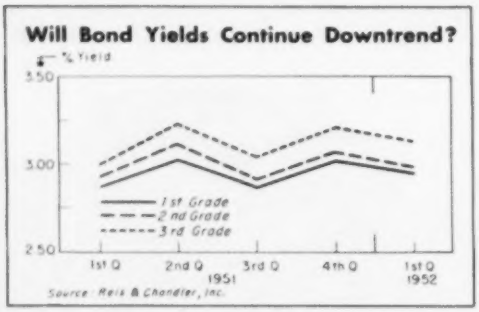
Write us for the name and address of the Kuhlman representative in your area, and for bulletins describing distribution, power, Saf-T-Kuhl, dry type, and specialty transformers. For power transformers, specify Bulletin CS-601.

Kuhlman

KUHLMAN ELECTRIC COMPANY • BAY CITY, MICHIGAN

EXPORT REPRESENTATIVES: *International Standard Electric Corporation,*
67 Broad Street, New York 4, N.Y. Cable Address, Microphone, N.Y.

ELECTRICAL BUSINESS OUTLOOK



Bond Yields—Up? Down?

Analysts believe that the downward trend will continue for rest of 1952. But strong minority thinks the opposite. Both have their reasons

Wall Street isn't sure whether or not the recent downtrend in utility bond yields will continue for the rest of 1952. You can get strong arguments both ways.

Most analysts expect the bond market to continue its recent pattern. This is how they argue:

1. In the economy generally, inflationary pressures are easing. Commodity prices are going down. So are stock prices, probably. This means the purchasing power of the dollar—and so of fixed dollar investments, like bonds—is rising. And under such conditions, you always have a strong bond market.

2. The supply of funds available for investment in bonds is increasing. Money is accumulating in savings banks, insurance companies, and pension funds because of the high rate of personal saving. Insurance companies particularly are working out of the very high mortgage commitments they've had and can put more accruing funds into bonds.

Institutions Can Buy Stocks . . . Of course, these institutions can put more of their money into stocks under recent legislation. But this isn't a very good time, some of them feel, to invest in anything but the highest quality common stocks. For the time being, most of their new funds are likely to go into preferred stocks and bonds.

3. There probably won't be as many new corporate bonds coming on the market from now on. The utilities, of course, still have plenty of financing to do, because their expansion plans run ahead to 1954. But industry generally will hit the peak of plant expansion this year. And the heaviest financing has already been done or will be shortly.

With fewer new issues coming on the market and funds still increasing, savings institutions will bid more actively for outstanding issues.

4. The government will be encouraging easier money, not tighter money. As long as inflation threatened, the monetary authorities were interested in keeping credit tight. But with some deflation in prospect and an election coming up, they're now likely to want easier credit terms for business.

Also the Treasury wants low rates for its own borrowing. Bond analysts had feared that the Treasury would issue a 3%, 30-year bond as part of this year's financing. That might have raised the yields on corporate bonds. But instead, Uncle Sam came out with another 2¾% bond, like the ones sold last year. That indicates future Treasury issues will be within the existing yield pattern and won't disturb the market.

Minority Forecasts Rise in Yields . . . There is a strong minority, however, which thinks that bond prices have already gone high enough, even in the light of these favorable factors. Therefore, with prices going down, yields will go up. Here is how they argue:

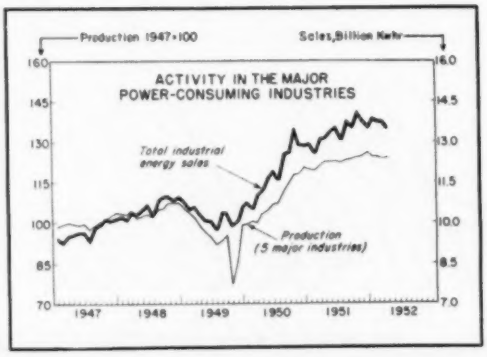
1. There may very well be a revival of inflationary pressures, or at least a revival of strong business conditions, in the second half of 1952. Stock and commodity prices may rise a bit (we usually get rallies in the fall). And this will dampen interest in bonds.

2. If this happens, the rate of personal saving will probably slow down. Institutions won't be accumulating funds so fast. And they may put more of them into stocks and real estate.

3. It's not sure that the quantity of new investments offered to savings institutions will decline. Even if industrial bond offerings decline, there may be a rise in demand for residential and commercial mortgages. Activity in these fields is picking up fast.

4. There has been a shortage of long-term, marketable Treasury bonds. (The new 2¾% bond is also non-marketable.) So prices of all marketable bonds, Treasuries and corporates, have been bid up. Eventually, the Treasury will have to sell some intermediate and long-term marketable bonds. This will ease the pressure on other bond yields.

It's clear the bond market's on a stronger basis than a year ago. But just how strong? It makes a big difference in utilities' money costs.



for *Power Transformers* of *Superior Performance*

WHEN you specify **Moloney Power Transformers** you are specifying *"superior performance."* For over 50 years Moloney has been accumulating experience, skill and facilities to make this possible. You will know beforehand that from your Moloney Transformer, which can be test-proved on our 3,600,000 volt Surge Generator, you can expect *better* performance, *greater* reliability and *less* maintenance expense.

MOLONEY ELECTRIC COMPANY

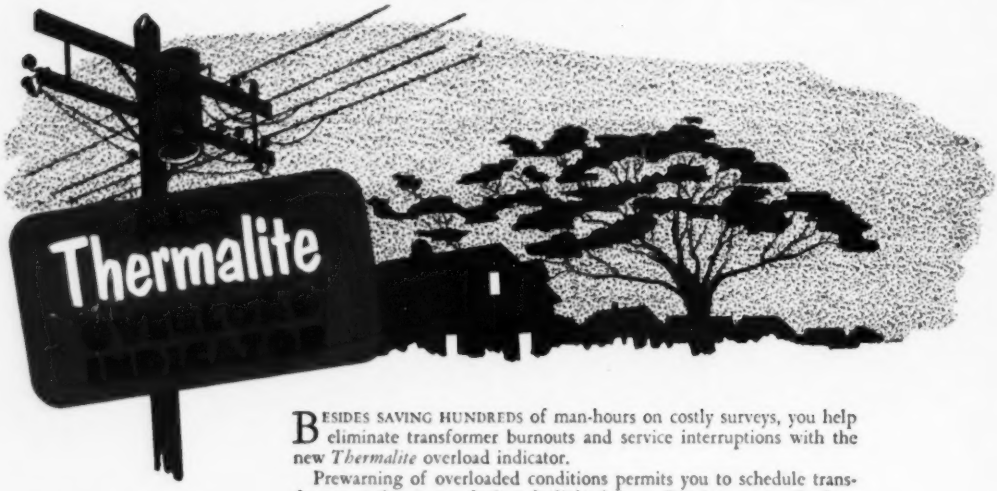
Manufacturers of Power Transformers • Distribution Transformers • Load Ratio Control Transformers Step Voltage Regulators • Unit Substations

MOLONEY ELECTRIC = { BETTER PERFORMANCE / GREATER RELIABILITY / LESS MAINTENANCE

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS, MO. AND TORONTO, ONT., CANADA

Here's the Low Cost Way

TO DETECT TRANSFORMER OVERLOADS



Time Saving Visual Check of Transformers with Thermalite Device Offers Permanent, Continuous and Inexpensive Load Check

BESIDES SAVING HUNDREDS of man-hours on costly surveys, you help eliminate transformer burnouts and service interruptions with the new *Thermalite* overload indicator.

Prewarning of overloaded conditions permits you to schedule transformer replacements during daylight hours. But in no case is there interruption of power service . . . because the *Thermalite* indicator operates purely as a signal device. It provides quick warning that the transformer should be replaced with a larger transformer or the load rearranged at the earliest convenient time.

Quiet in operation and simple in construction, the low cost *Thermalite* indicator is recommended for systems where more expensive devices are not feasible.

NOTE THESE IMPORTANT ADVANTAGES

1. The red warning light is actuated by a thermostatic element in the top oil. Light remains on until reset by convenient handle.

2. The device is engineered, calibrated and installed at the factory. It costs virtually nothing to maintain and it is dependable in operation.

3. It operates in all types of weather and is well protected from the elements. The brilliant light permits you to check overloading conditions visually from your service truck.

For more information contact your A-C sales office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3692

Thermalite is an Allis-Chalmers trademark.

ALLIS-CHALMERS

The Allis-Chalmers overload indicator is available on distribution transformers 100 kva and smaller, 15 kv and lower.